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STATISTICAL BULLETIN

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Metropolitan Life

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Perhaps no single event can evoke a greater emotional response than an infant's accidental death. In this *SB*, we have examined this sensitive, vital statistic and have also considered its prevention. We observed that the reported infant death rate from accidents declined over 50 percent between 1970-80. Most of the change in rates occurred in the respiratory category (suffocation or inhalation of foreign bodies). Whether this decline is real, or related to changes in coding of these deaths as Sudden Infant Death Syndrome (SIDS) since 1973, remains unknown, however. In an accompanying editorial, *SB* comments on this analytical dilemma and the problem it represents for proper evaluation of infant accident prevention efforts.

Happily the industrialized Western world (as well as Japan, Israel, New Zealand and Australia) grows healthier. This piece of good news emerges from *SB*'s most recent analysis of international trends in mortality from all causes, 1976-81. Americans generally share in this healthier state of affairs, although working age Americans (25-64 years) do not compare as favorably as similar groups in other countries (except the United Kingdom).

Health and medical disability benefits receive much adverse attention these days. In this *SB*, Metropolitan reveals its most recent experience (1982-83), and bucks this trend with some good news: the work loss rate for medical reasons among Metropolitan Life Insurance Company employees has declined since its previous study (1980-81). In an accompanying commentary, Metropolitan's Human Resources Department discusses the decrease and how it may relate to recently instituted company policies.

Demographically, which is the age group that always deserves a rousing cheer? Why, the 25-64 year olds, of course. They keep our country's social and economic engines humming. *SB* provides a demographic profile of this key age group and a projection of its population growth to the year 2050. From this analysis, there seems a strong presumption of continued American economic vitality well into the 21st century.

Does your health insurance coverage provide for preventive care? Chances are, if you are like most Americans, it does not. However, a pilot study (INSURE) begun in 1980, sponsored by several insurance companies (including Metropolitan), might change all that. This *SB* reports preliminary results from the INSURE Project that are most encouraging. The investigators, Donald Logsdon and Matthew Rosen, found that physicians and patients liked preventive services and, further, it was not expensive.

On that uplifting note, I wish you good reading.

Charles B Arnold

The Statistical Bulletin will publish comment and criticism from readers about its contents. Alternate interpretations of data analyses or different points of view about subjects are particularly welcome. Use address at end of publisher's statement, opposite page.

Children under age one have more deaths from accidents than any other year in childhood, a period in life when accidents are the leading cause of death. However, the high mortality from congenital anomalies, sudden infant death syndrome, pneumonia, and certain conditions originating in the first 28 days of life (neonatal period) tends to overshadow the death toll from accidents in the first year.

During the past decade, the reported infant mortality rate from accidents has declined sharply. However, the decision in 1973 by nosologists to classify sudden infant death syndrome (SIDS) as a separate diagnosis probably resulted in coding many subsequent deaths as SIDS which formerly may have been categorized as suffocation or strangulation (accidents) or infection. Expert opinion is uncertain, however, about the statistical effects of this reclassification. It seems reasonable to conclude that the observed statistical decline in accident mortality during 1970-80 was probably more apparent than real. Nonetheless, deaths under age one from accidents remain a challenging national problem to health educators, pediatricians, government agencies, industry, as well as to all parents.

"At every stage of life, even in infancy, mortality from accidents is far greater among males than among females."

In 1980 there were 32.3 accidental deaths per 100,000 live births. Figure A shows that the reduction since 1970 has been especially marked in the neonatal period—a time when many sudden infant deaths occur—when the reported accident rate dropped by about two-thirds, from 6.6 per 100,000 live births in 1970 to 2.4 in 1980. During the same time, the death rate for children in the remaining 11 "first-year" months decreased by slightly less than half, from 54.9 per 100,000 live births to 29.9. The figure also indicates a decrease in *accidental* mortality in the neonatal and postneonatal periods during the past decade, greater than the decrease in all causes. This difference is probably attributable to the recoding of SIDS since 1973.

About seven out of 10 *nonaccidental* infant deaths are diagnosed in the first 28 days of life. In contrast, less than one out of 10 infant deaths classified as *accidental* occur in this period. From the age of 28 days through 4 months, babies are considered the victims of more than two-fifths of the accident fatalities. Thus, about half of the infants who are reported to sustain fatal injuries are less than 5 months old and more than two-thirds are younger than 7 months. In later infancy, the number of deaths attributed to accidents levels off.

At every stage of life, even in infancy, estimated mortality from accidents was far greater among males than among females. In 1979-80, the accident death rate among infant boys for all accidents combined was 35.0 per 100,000 live births, about 25 percent greater than the corresponding rate of 28.1 among infant girls.

Suffocation—Ingested Food or Object

Inhalation and ingestion of food or other objects causing obstruction or suffocation—always the leading cause of fatal injuries to infants—accounted for almost a fourth of all deaths from accidents in infancy in 1979-80. The death rate for baby boys was a third higher than the corresponding rate for baby girls. Mortality from this type of accident is highest in early infancy: about a tenth of such infant deaths from this cause occurs during the first four weeks of life, and an additional third of the total takes place in the following two months. Deaths from such accidents are due primarily to suffocation from vomitus, milk or other liquid food, but many result from suffocation or

Mortality from Accidents Among Infants

United States, 1969-70 and 1979-80

	Death Rate per 100,000 Live Births					
	1969-70			1979-80		
Type of Accident	**Both Sexes**	**Boys**	**Girls**	**Both Sexes**	**Boys**	**Girls**
All Accidents	64.5	69.4	59.2	31.6	35.0	28.1
Inhalation and ingestion of food or other object causing obstruction of respiratory tract or suffocation	20.1	22.2	18.0	7.4	8.5	6.3
Motor Vehicle	9.8	9.5	10.1	6.6	6.9	6.3
Mechanical suffocation	16.2	18.1	14.3	5.0	5.6	4.2
Fires and flames	4.4	4.3	4.5	4.2	4.0	4.4
Drowning and submersion	2.1	2.1	2.0	2.4	2.8	1.9
Falls	3.9	4.7	3.0	1.4	1.7	1.2

Source of basic data: Reports of Vital Statistics Division, National Center for Health Statistics.

obstruction by objects such as safety pins, buttons or small parts of toys.

Motor Vehicle Accidents: Largely Preventable

Deaths from motor vehicle accidents ranked second as a cause of accidental deaths among infants in 1979-80. Infant mortality from this cause dropped by a third overall during the 10-year period under review. In 1979-80, mortality from motor vehicle accidents accounted for slightly more than a fifth of the total accident mortality among infants; the death rate from such accidents among baby boys was 10 percent higher than among baby girls. Experts believe that many such deaths could be prevented and the severity of injuries reduced if infants were properly restrained in safety seats. For example, one detailed 10-year study based on experience in the state of Washington concluded that child safety seats are 80 to 90 percent effective in preventing fatalities and injuries among children under 5 years of age.[1]

It has been estimated that, unfortunately, fewer than 15 percent of babies riding in cars were properly restrained. As of June 1, 1984, 46 states and the District of Columbia had enacted some form of passenger restraint laws for young children. It is recommended that an infant restraint be installed in the middle of the rear seat. The National Highway Traffic Safety Admin-

> "Fewer than 15 percent of babies riding in cars are properly restrained."

istration continues to caution parents about improperly installed child safety seats, urging that they always determine that the restraint is properly secured.[2] Infant car seats made on or after January 1, 1981, must meet a strict federal safety standard, but investigations have found that many car seats sold in stores, bought second hand or rented do not comply with this regulation. Parents can ascertain that a chosen car seat meets the federal standard by consulting the Family Shopping Guide to Infant/Child Automobile Restraints, available from the American Academy of Pediatrics or from the Health and Safety Education Division of Metropolitan Life Insurance Company.

"Accidents take more lives among babies in the first year of life than among children in any single year at the preschool and school ages."

Suffocation—Mechanical

During the decade 1970-80, accidental mechanical suffocation—attributed to smothering by bed clothing, plastic material, etc., and strangulation by head entrapment or by strings or cords on clothes, toys or other products declined by 70 percent, probably related to the SIDS reclassification. Yet mechanical suffocation accounted for about a sixth of the total deaths from accidents in 1980. However, in 1979-80 mortality from this cause was about 33 percent higher among baby boys than among baby girls. Since risk from mechanical suffocation occurs primarily because of exposure to hazardous products, the combined federal and industrial efforts to reduce these risks clearly need to continue.

Head Entrapment Hazard

Over the past 10 years, the U.S. Consumer Product Safety Commission (CPSC) has been concerned with the many fatalities and near misses resulting from children getting their heads caught in various products. Using death certificates, in-depth investigations, consumer complaints, and news clippings,[3] the commission recently concluded a study of head entrapment incidents that occurred in children under 10 years of age from July 1973 through April 1983. The purpose of this study was to present an overall picture of the head entrapment hazard and to identify the various types of products associated with it.

The study indicated that children under 12 months of age were at greatest risk; of the cases studied, 45 percent of the victims were under 1 year of age. Most of these incidents involved such products as cribs, playpens, baby swings, beds, mattresses and sofas. Usually, the baby became entrapped between two objects (such as a mattress and the side of a crib) or within a part of the product (headboard cutouts, frame of a bed, bar of a swing, etc.).

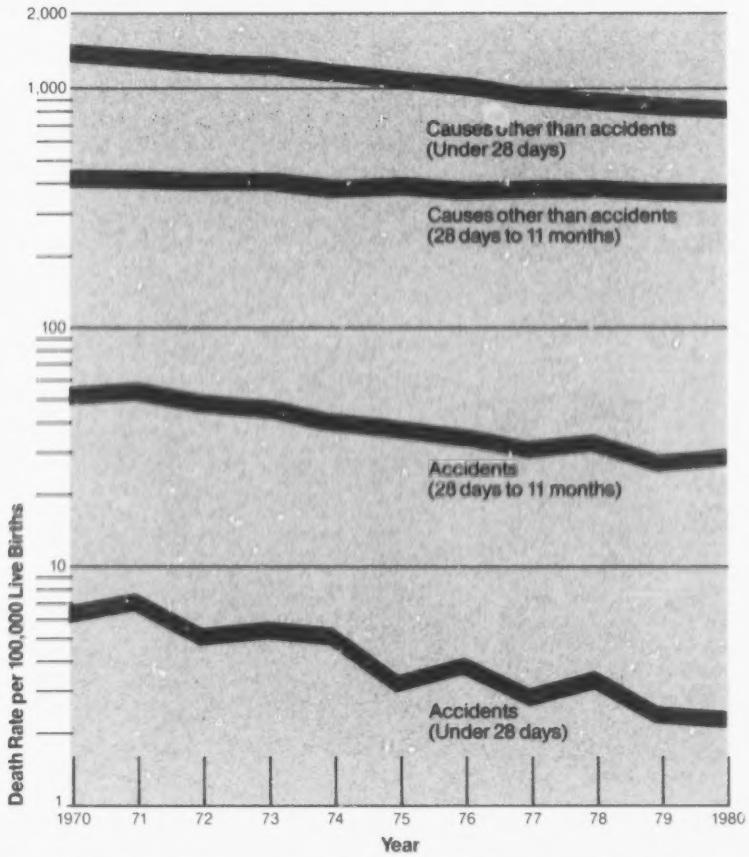
During the past 10 years, several federal regulations and industry activities such as mandatory standards, consumer alerts and recalls have addressed the possible entrapment hazard associated with cribs and have indeed helped to reduce the frequency of incidents and fatalities. However, the many incidents of this nature that still occur, often involving *older* model cribs, demonstrate the need for increased parental awareness, and more education to help minimize this hazard. Preventive measures include: ascertaining that crib slats meet the CPSC standard, placing rolled towels around the crib mattress when there is a gap between the mattress and crib, and examining the crib for any other possible entrapment hazard.

"The leading type of fatal injuries to infants is suffocation from inhalation and ingestion of food or other objects."

Ligature Strangulation Hazard

Accidental ligature strangulation (cases in which something around the neck tightened and resulted in strangulation) was the subject of another recent study by the CPSC.[4] In analyzing such incidents among children under 5 years of age, the commission found that in more than half of the cases, the object around the child's neck was caught on some other "secondary" product. This study also found that, as shown in Figure

Figure A–Infant Mortality From Accidents and From Causes Other Than Accidents, by Age
United States, 1970-1980



Source of basic data: Reports of Vital Statistics Division, National Center for Health Statistics

B, babies ages 9-12 months were involved in more ligature strangulations than in all children ages 1-4 years combined. This 9-12-months age is when infants become very active and acquire new physical abilities, reaching places and doing new things. It is a challenging period of life for parents, with special risks to the infant.

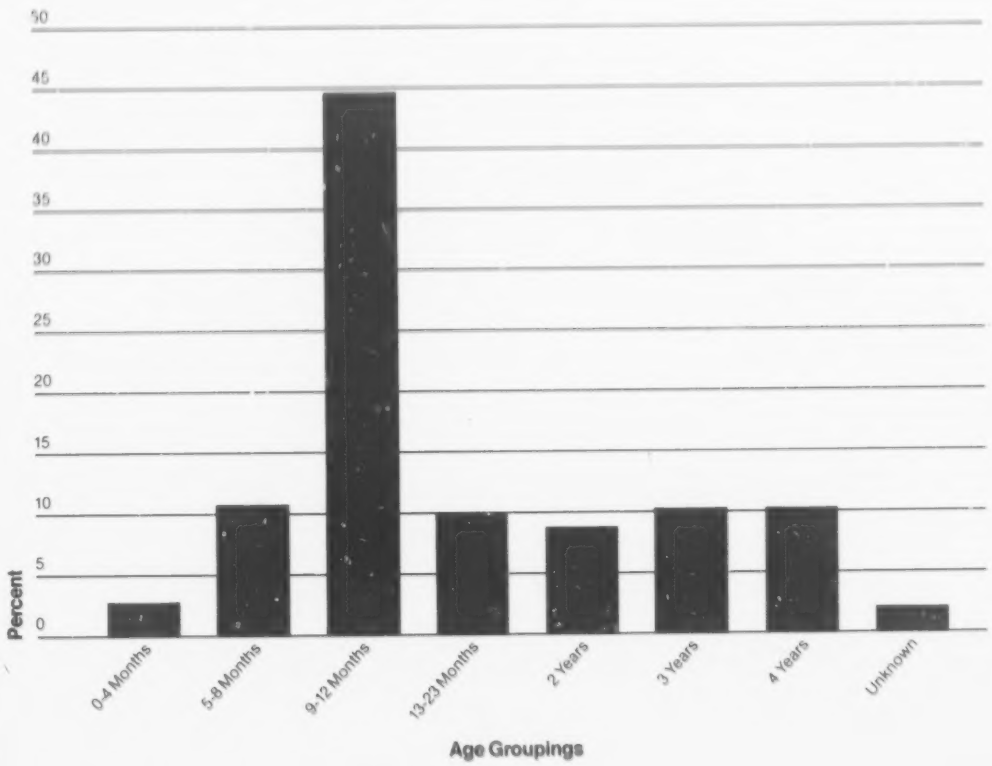
Industry Activities for Infant Safety

The Juvenile Products Manufacturers Association (JPMA), a national industry association composed of more than 100 companies that manufacture baby furniture and accessories, has developed a voluntary certification and labeling program in a combined effort to reduce risks from hazardous products. This

program guarantees that rigorous safety standards for high chairs, strollers, carriages, etc., have been met by manufacturers whose individual product models are awarded certification labels. Standards were developed for JPMA by an independent group, The American Society for Testing and Materials. The JPMA label, showing a parent protecting a child, can be applied to product models meeting the association's safety standards. To continue in JPMA, the manufacturers are required to submit their products for retesting every year to assure that they continue to meet the certification requirements. Parents are advised to look for the JPMA seal when considering the purchase of infant furniture. One must, however, continue to exercise caution when using secondhand or hand-me-down baby furniture because of the

Figure B–Ligature Strangulation Incidents Involving Children Under 5 Years of Age

Percent Distribution by Age, 1973-1980



Source of basic data: U.S. Consumer Product Safety Commission.

potential hazards involving pre-safety-standard products.

Parents cannot anticipate all the hazards a baby may encounter. Finding the right balance between encouraging the infant's independence and providing protection from harm is not a simple matter. Parental awareness of potential hazards in the baby's environment can greatly reduce the risk of accidents.

[3] Scherz R. Fatal motor vehicle accidents of child passengers from birth to four years of age in Washington State. *Pediatrics* 68:572-575, Oct 1981.

[4] *IIHS Status Report*. Insurance Institute for Highway Safety. 19:8-9, Apr 14, 1984.

[5] Miles R, Rutherford G, Coonley R. Structural entrapment hazards to infants and children. U.S. Consumer Product Safety Commission. Sept 1983.

[6] Rutherford GW, Kelly S. Accidental strangulations (ligature) of children less than 5 years of age. U.S. Consumer Product Safety Commission. May 1981.

Are We Succeeding: Yes or No?

The infant death rate from accidents declined by about 50 percent during 1970-80. Does this represent one of America's recent public health triumphs? The answer is: maybe, but...

SB joins others in sharing the perplexity this frivolous answer engenders. As we described in this issue in "The Risky First Year of Life," the principal components of the infant accidental death rate decline were in the categories of suffocation and strangulation. This downturn cannot, however, be greeted as positively as one wishes.

In the late 1960s, increasing clinical recognition was given to Sudden Infant Death Syndrome (SIDS) as a public health problem, but no specific diagnostic code was available for it in the Eighth Revision of the *International Classification of Diseases* (1967-78) until 1973. As a result, nosologists and others coding death certificates for analysis had to select other likely categories to which they could assign those sudden deaths. Unfortunately, vital statisticians, epidemiologists and clinicians did not spot the analytic implications at that time.

Were many SIDS coded as strangulation or suffocation or infections? Undoubtedly, they were; however, the more difficult question to answer is: *How many* or what proportion of the total were so coded? What we now know is that the SIDS death rate rose steadily during the 1970s and that the increase in the SIDS death rate was associated with a commensurate decline in the infectious disease death rate. Hopefully, further research on causes of SIDS may provide insights into this problem.

There is a major economic side to this story, too. The federal government and childhood consumer product industries began in the early 1970s to take determined and expensive steps to reduce environmental risks in infancy. Some of these efforts continue today, such as the Consumer Product Safety Commission and specific industrial associations. Should these associations be continued as they exist? Should they strive to be more intensive and far reaching? Statistical answers to these important socioeconomic questions cannot be provided because diagnostic assignments and coding practices were not adequately monitored. Perhaps, with recognition of its importance, we may yet know whether a lower reported infant accidental death rate for 1970-80 represented a public health success.

The Editors

CONTINUED DECLINE IN MORTALITY IN THE UNITED STATES, CANADA, AND WESTERN EUROPE

The total mortality rate for selected Western industrialized countries continued to decline during 1976-81. Elsewhere in the world, Japan, Israel, Australia and New Zealand had similar favorable experiences. These changes in mortality reflect downturns in cardiovascular death rates as well as in infant mortality rates.

Tables 1 and 2 present a comparison of death rates from all causes by sex and age during 1976 and 1981 in the first group mentioned above. The death rates have been age adjusted in order to make valid comparisons between the countries. This adjustment takes into account the considerable variations in the age distribution among countries.

Death rates in the United States are often compared with those in particular countries of Western Europe. However, because of its size, population, diversity and degree of industrialization, the United States is more

"The highest mortality among men and women was experienced in Scotland and Northern Ireland."

appropriately regarded as a continent rather than as a homogenous national entity (such as Denmark, Norway, Sweden, or the Netherlands). Therefore, it is more fitting to compare mortality for the United States as a whole with the rate for the large block of industrialized countries of Western Europe—United Kingdom, France, Germany and Switzerland. These nations as a group more closely resemble the United States in size of population, degree of industrialization, variety of ethnic and cultural strains, and range of socioeconomic conditions.

In 1981, the latest year for which comparable data are available, the age-adjusted mortality rates for men were 6.9 per 1,000 population in Canada, the Scandinavian countries and the Netherlands, and were 7.7 per 1,000 population in the United States, as well as in the block of Western European countries.

At the same time, for women, the death rates ranged from a low of 4.0 per 1,000 in Canada, the Scandinavian countries and the Netherlands, to 4.4 in the United States, and 4.5 in the more industrialized countries of Western Europe. With just a brief observation of the data in the tables, it can be ascertained that the gap in the range of the death rates has narrowed in the past five years.

Sex Patterns Similar

Among the individual countries under review, mortality among men was highest in Scotland—8.9 per 1,000—closely followed by that in Northern Ireland—8.7 per 1,000. In the countries listed in the table, mortality was lowest for men in Sweden, namely 6.6 per 1,000. However, for Japanese men (not shown) the mortality rate was only 5.9 per 1,000. Among women, those living in the Netherlands, Norway and Switzerland experienced the same lowest age-adjusted mortality rate—3.8 per 1,000. (In Japan the rate was 3.7 per 1,000.) As was the case for men, the highest mortality among women was experienced in Scotland and Northern Ireland.

Figures A and B present a graphic picture of the relative mortality standings for men and women in the

"The decline in death rates reflects downturns in mortality from cardiovascular diseases as well as in infant mortality."

countries under review with that of the United States. A glance at Figure A reveals that the death rate for men from all causes in Sweden was just 86 percent of the

Table 1—Mortality Among Men in Selected Countries
1976 and 1981

Country	Annual Death Rate* per 1,000 Population									
	1976					1981				
	All Ages	Ages Under 25	Ages 25-44	Ages 45-64	Ages 65 and Over	All Ages	Ages Under 25	Ages 25-44	Ages 45-64	Ages 65 and Over
United States										
White	8.1	1.5	2.2	12.3	63.6	7.4	1.3	2.1	10.9	58.5
All Other	10.8	2.4	5.4	19.7	61.6	9.7	1.8	4.4	17.7	59.9
Total	8.4	1.6	2.6	13.1	63.4	7.7	1.4	2.4	11.7	58.6
Canada	7.8	1.5	2.0	11.6	62.0	6.9	1.2	1.8	10.0	56.7
Denmark	7.6	1.1	1.7	11.0	64.9	7.5	.9	1.8	10.9	64.6
Norway	7.0	1.1	1.5	9.8	60.2	6.8	.9	1.4	9.5	59.8
Sweden	7.0	.9	1.8	9.3	62.0	6.6	.7	1.6	8.9	59.0
Netherlands	7.4	1.0	1.3	10.3	65.7	6.8	.9	1.2	9.1	61.9
Weighted Average	7.3	1.0	1.5	10.1	63.6	6.9	.9	1.4	9.4	61.1
United Kingdom										
England and Wales	8.6	1.2	1.5	12.1	75.9	7.6	1.0	1.3	10.7	67.6
Northern Ireland	9.7	1.7	2.2	13.6	82.3	8.7	1.3	1.8	12.3	75.8
Scotland	9.8	1.3	2.0	14.9	83.2	8.9	1.1	1.9	13.5	76.0
France	8.1	1.3	2.4	12.4	63.2	7.5	1.3	2.2	11.2	58.7
Germany, Federal Republic	8.9	1.6	2.2	12.1	74.6	8.0	1.2	2.0	10.9	68.9
Switzerland	7.1	1.2	1.6	9.7	61.1	6.7	1.1	1.5	9.0	58.1
Weighted Average	8.5	1.4	2.0	12.2	71.4	7.7	1.2	1.9	10.9	65.3

*Adjusted on basis of age distribution of the United States total population, 1940

Note: France—data for 1981 not available; 1980 figures used.

Source of basic data: National Center for Health Statistics, Statistics Canada and *World Health Statistics Annual*.

overall mortality rate of men in the United States. In addition, men residing in Switzerland, the Netherlands, Norway and Canada experienced death rates that were also 10 percent or more below the rate for men in the United States. On the other hand, comparative mortality in Scotland and Northern Ireland was higher by 16 and 13 percent, respectively.

The scenario presented by the female mortality analysis shown in Figure B is similar to that for males although the United States fared somewhat more favorably. In the Netherlands, Norway, Switzerland and Sweden mortality for women was over 10 percent

Table 2—Mortality Among Women in Selected Countries
1976 and 1981

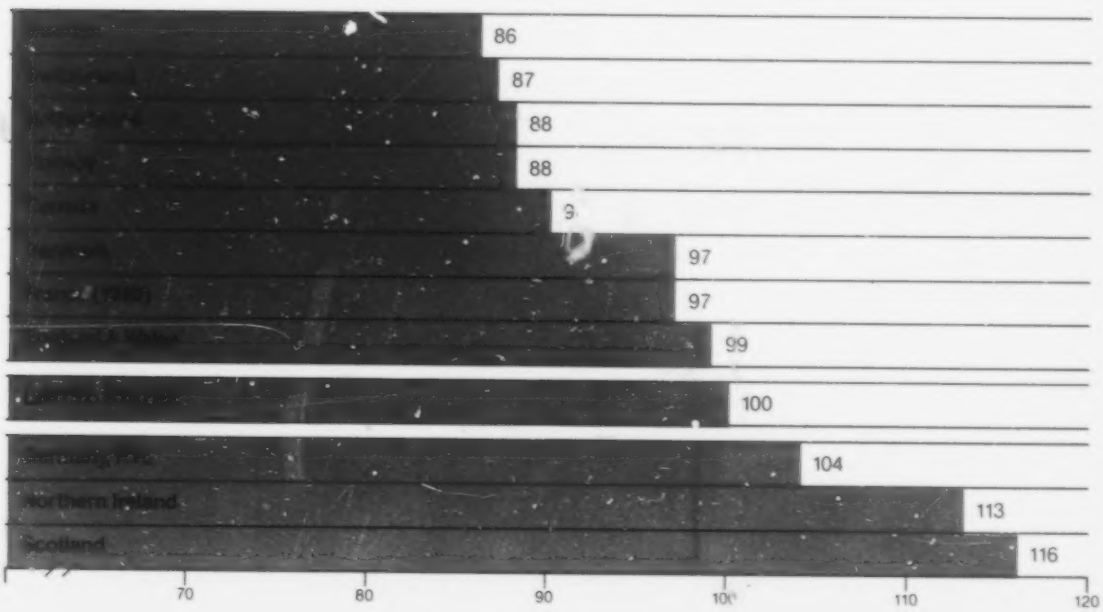
Country	Annual Death Rate* per 1,000 Population									
	1976					1981				
	All Ages	Ages Under 25	Ages 25-44	Ages 45-64	Ages 65 and Over	All Ages	Ages Under 25	Ages 25-44	Ages 45-64	Ages 65 and Over
United States										
White	4.6	.8	1.1	6.2	38.7	4.2	.7	1.0	5.7	36.3
All Other	6.4	1.5	2.4	11.0	41.9	5.6	1.1	1.9	9.4	39.1
Total	4.8	.9	1.3	6.7	39.0	4.4	.8	1.1	6.2	36.6
Canada	4.4	.8	1.0	5.6	38.0	4.0	.7	.9	5.2	34.5
Denmark	4.8	.6	1.1	6.5	42.3	4.6	.6	1.0	6.4	39.9
Norway	4.2	.7	.7	4.7	39.5	3.8	.5	.7	4.3	37.1
Sweden	4.3	.6	1.0	4.8	40.6	3.9	.4	.8	4.5	37.9
Netherlands	4.2	.7	.8	4.8	39.8	3.8	.5	.8	4.5	35.5
Weighted Average	4.3	.7	.9	5.1	40.4	4.0	.5	.8	4.8	37.2
United Kingdom										
England and Wales	5.2	.7	1.0	6.7	48.2	4.7	.6	.9	6.0	43.3
Northern Ireland	6.0	1.1	1.2	7.8	53.1	5.2	.7	.9	7.0	47.9
Scotland	5.9	.8	1.2	8.5	51.2	5.5	.6	1.0	7.7	49.6
France	4.4	.8	1.1	5.1	39.3	4.0	.7	1.0	4.5	36.0
Germany, Federal Republic	5.3	1.0	1.1	6.2	48.0	4.6	.7	1.0	5.3	43.7
Switzerland	4.1	.7	.8	4.6	38.9	3.8	.6	.8	4.2	36.2
Weighted Average	5.0	.8	1.1	6.1	45.4	4.5	.7	1.0	5.3	41.3

*Adjusted on basis of age distribution of the United States total population, 1940.
Note: France—data for 1981 not available; 1980 figures used.
Source of basic data: National Center for Health Statistics, Statistics Canada and *World Health Statistics Annual*.

less than in the United States, and in Canada and France the death rates were 91 percent of those in our country. However, in 5 of the 12 countries reviewed in this study mortality for women was higher than in the United States. In fact, during 1981, relative mortality in Scotland was 25 percent higher than that in the United States while, at the same time, in Northern Ireland, England and Wales the figures were 18 and 7 percent, respectively. Women living in Denmark and the Federal Republic of Germany experienced death rates 5 percent greater than their contemporaries in the United States.

Figure A–Relative Male Mortality From All Causes

United States Compared With Selected Countries, 1981



U.S. Rates High Overall

For men and women under 25, death rates in 1981 were lowest in Scandinavia and the Netherlands and highest in the United States. The rates among men were 0.9 per 1,000 and 1.4 per 1,000, respectively. In Canada and in the block of industrialized countries of Western Europe, the rates among men were 1.2 per 1,000. For women the age-adjusted death rates in the latter areas were 0.7 per 1,000 while in the United States the rate was 0.8 per 1,000, and was only 0.5 per 1,000 in the Scandinavian countries and the Netherlands.

"For men and women under 25, death rates in 1981 were lowest in Scandinavia and the Netherlands and highest in the U.S."

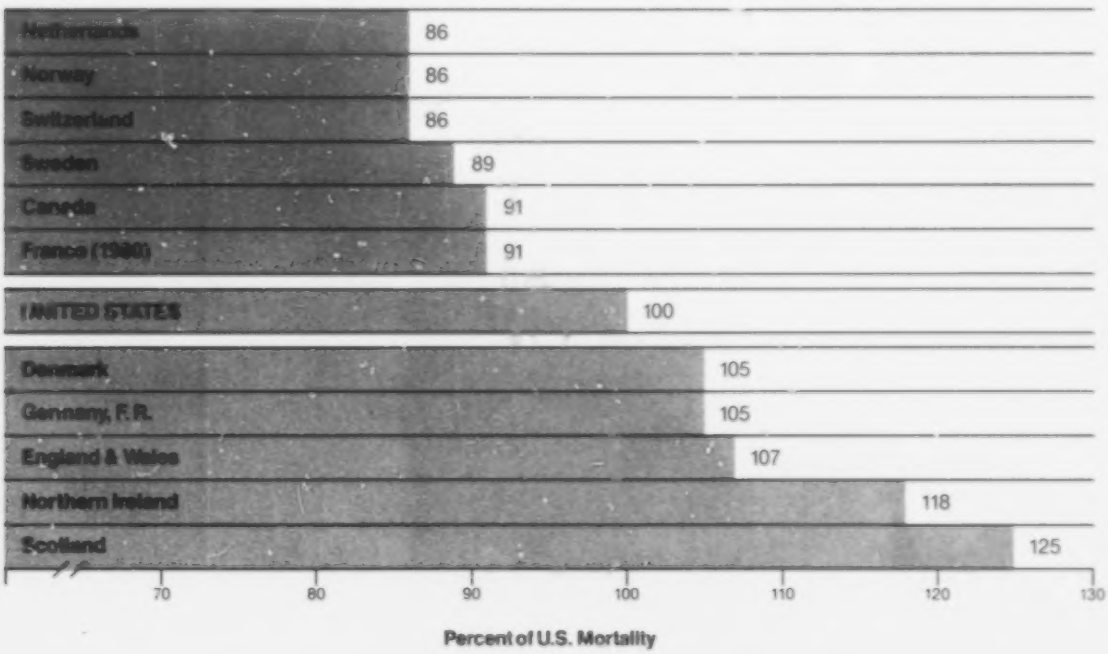
At ages 25-44 and, for that matter, for ages 45-64, mortality for both men and women was lowest in the Scandinavian countries and the Netherlands as a group. In the United States the death rates for both

men and women at these ages were higher than any of the other group of countries under review. At ages 65 and over, however, the death rates were higher in the industrialized countries of Western Europe, the Scandinavian countries and the Netherlands than in the United States. The lowest mortality rate among older persons was recorded in Canada.

Women continue to enjoy more favorable mortality experience than men. The age-adjusted female death rates for all ages combined were just three-fifths the rates for males. A comparison of the mortality differentials by age group shows that there is some variation with changing age, although the disparity in favor of women is still very much apparent.

Figure B–Relative Female Mortality From All Causes

United States Compared With Selected Countries, 1981



STATISTICAL BULLETIN JAN-MAR 1985

LOSS OF WORKDAYS FOR MEDICAL REASONS AMONG METROPOLITAN EMPLOYEES IN 1982-83

Personnel of the Metropolitan Life Insurance Company experienced a lower rate of work days lost due to medical reasons* in 1982-83 than in 1980-81. Among employees in the home office, head offices, and the field, new cases of medically related loss of work occurred at an average annual rate of 140 per 1,000 in 1982-83, about 8.5 percent below the rate of 153 per 1,000 recorded in the previous two-year period. This is the lowest rate recorded since 1976. Between 1980-81 and 1982-83, rates of medically related work loss decreased for saleswomen and for all men, but rose slightly for women office employees.

Sex Differentials in Medical Work Loss Rates

Table 1 gives the incidence of work lost for medical reasons by age for men and women in office and sales work during 1982-83. Women experienced considerably higher work loss rates than did men. Among office personnel, women recorded a rate of 197.6 per 1,000 as compared with 100.6 for men; among sales personnel, the corresponding rates were 141.4 and 97.1, respectively. As indicated in the table, even when maternity-related work losses are excluded, women continue to have higher medical work loss rates than men: 142.5 for office personnel and 115.0 for sales personnel.

Age Patterns in Medically Related Work Loss

Older male employees were off work because of medical reasons more frequently than younger male employees, the rates generally rising with advance in age. Among male office personnel, the annual incidence was 177 per 1,000 at ages 55-64, almost double the rate of 97 per 1,000 recorded at ages 17-24. Among salesmen, the rate at ages 55-64 was 163 per 1,000, nearly three times that at ages under 25.

The experience among women, however, followed a much different pattern. Among female office workers, the highest incidence of such disability occurred at the younger ages: the rate dropped from 217 at ages 17-24 to 173 at ages 45-54, and then rose to 199 at ages 55-64. Among female sales personnel,

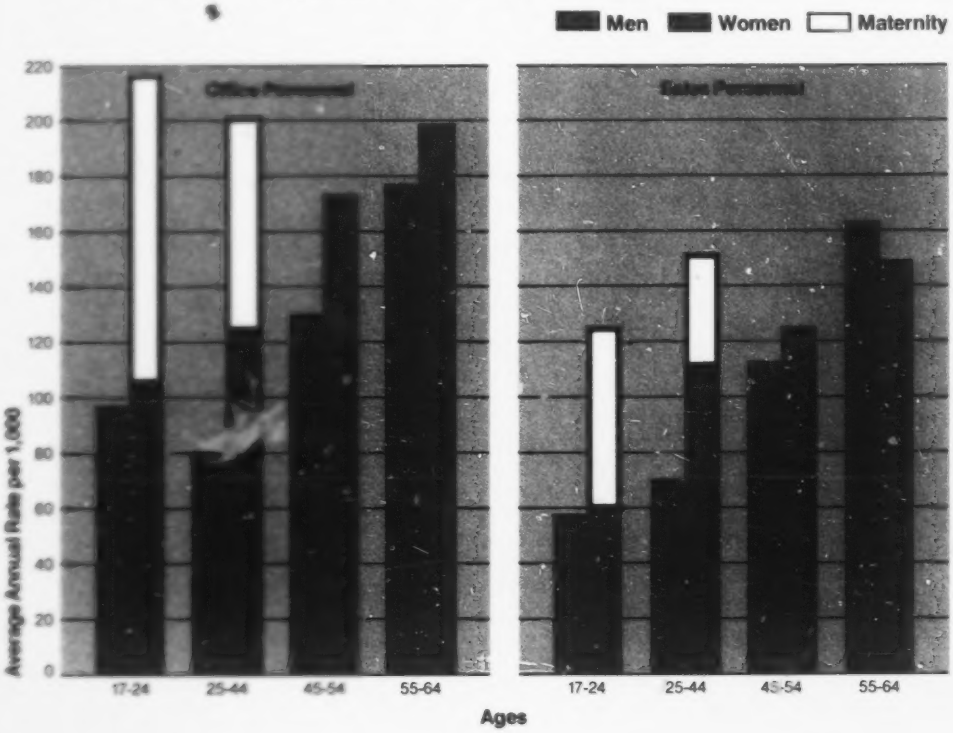
*Limited to cases of illness lasting longer than a week to a maximum of 26 weeks. If still disabled, employees receive further benefits under another part of the Company's Insurance and Retirement Program.

Table 1—Incidence of Workdays Lost Due to Medical Reasons* by Age and Sex
Personnel of Metropolitan Life Insurance Company,† 1982-83

	Average Annual Incidence per 1,000					
	Office Personnel			Sales Personnel‡		
Age Group	Men Total	Women Total	Excluding Maternity	Men Total	Women Total	Excluding Maternity
17-64	100.6	197.6	142.5	97.1	141.4	115.0
17-24	97.4	217.2	105.7	58.4	124.9	60.7
25-44	79.1	200.7	125.3	70.9	150.4	113.7
45-54	131.0	172.7	172.7	113.0	125.2	125.2
55-64	176.7	198.5	198.5	162.9	148.6	148.6

*See footnote in figure for definition.
†Personnel in the Pacific Coast States and Canada are not included.
‡Employees in local sales offices and the field (including clerical).

Incidence of Workdays Lost Due to Medical Reasons,* 1982-83
Personnel of Metropolitan Life Insurance Company



*Absence lasting longer than a week to a maximum of 26 weeks. Personnel in Pacific Coast States and Canada are not included.

on the other hand, the rate rose from 125 at ages 17-24 to 150 at ages 25-44, dropped back to 125 at ages 45-54, and then rose again to 149 at ages 55-64.

Table 1 shows that, with pregnancy and maternity effects removed from the medical data, work loss rates for women rose with advance in age as they did for men. Although women continued to have higher rates in all age categories except one (sales workers aged 55-64), rates for women office employees aged 17-24 and 55-64, and rates for women sales employees aged 17-24, 45-54 and 55-64 were quite close to those for corresponding men at these ages.

The figure compares work-days-lost rates for men and women in sales and office work by age category, and indicates the effects of pregnancy and maternity on the work loss rates among women.

Causes

Details of the illness-work-days-lost experience in 1982-83 by cause are presented in Table 2. Accidental injuries were the leading medical cause of work days lost among male office personnel at all ages combined; diseases of the respiratory system and diseases of the digestive system ranked next.

Table 2—Incidence of Workdays Lost for Medical Reasons by Cause

Personnel of Metropolitan Life Insurance Company,* 1982-83

Cause	Annual Incidence per 1,000									
	MALE					FEMALE				
	Ages 17-64	Ages 17-24	Ages 25-44	Ages 45-54	Ages 55-64	Ages 17-64	Ages 17-24	Ages 25-44	Ages 45-54	Ages 55-64
OFFICE PERSONNEL										
All Causes	100.6	97.4	79.1	131.0	176.7	197.6	217.2	200.7	172.7	198.5
Diseases of respiratory system	15.6	18.2	12.9	13.5	28.8	28.1	21.3	22.9	32.1	46.7
Diseases of digestive system	12.8	‡	11.3	14.7	20.1	16.6	18.0	16.0	16.8	17.1
Diseases of circulatory system	8.4	‡	‡	20.3	33.8	7.2	‡	3.6	10.9	18.6
Diseases of heart	5.8	‡	‡	12.4	25.1	2.8	‡	.9	4.9	9.0
Diseases of genitourinary system	3.9	‡	3.3	‡	‡	16.1	13.5	17.2	22.5	7.3
Maternity and related conditions	—	—	—	—	—	55.1	111.5	75.4	‡	—
Diseases of bones and other organs of movement	10.6	‡	7.1	18.1	21.3	15.3	7.4	11.3	22.7	27.3
Neoplasms—total	2.5	‡	‡	‡	‡	9.8	5.5	8.6	13.6	12.9
Benign	‡	‡	‡	‡	‡	2.9	‡	3.1	3.5	‡
Psychoneuroses and psychoses	3.4	‡	3.0	‡	‡	5.2	3.2	5.8	5.7	3.9
Accidental injuries	25.7	41.6	23.7	19.2	27.6	21.4	16.1	18.2	25.2	32.3
SALES PERSONNEL†										
All Causes	97.1	58.4	70.9	113.0	162.9	141.4	124.9	150.4	125.2	148.6
Diseases of respiratory system	8.5	9.1	8.1	7.5	11.1	14.4	10.6	12.2	14.2	26.9
Diseases of digestive system	13.2	‡	9.0	15.0	25.4	14.5	9.7	14.9	16.3	14.2
Diseases of circulatory system	14.5	‡	4.8	18.0	42.0	9.3	‡	5.1	14.2	23.9
Diseases of heart	9.3	‡	2.7	11.0	28.6	4.5	‡	‡	7.1	16.4
Diseases of genitourinary system	3.9	‡	2.7	4.9	6.6	16.6	‡	21.4	14.6	8.2
Maternity and related conditions	—	—	—	—	—	26.4	64.2	36.7	‡	—
Diseases of bones and other organs of movement	11.3	‡	7.2	15.3	20.4	12.7	‡	11.8	13.8	21.6
Neoplasms—total	1.9	‡	.8	‡	6.4	10.2	‡	10.2	12.5	11.9
Benign	.6	‡	‡	‡	‡	2.7	‡	3.4	‡	‡
Psychoneuroses and psychoses	6.5	‡	5.8	8.5	7.3	3.7	‡	4.1	‡	‡
Accidental injuries	21.3	23.9	20.8	22.4	20.2	17.9	13.2	18.2	17.9	20.2

See footnote in figure, page 15

*Personnel in the Pacific Coast States and Canada are not included.

†Employees in local sales offices and the field (including clerical).

‡Fewer than 10 cases in this category; rate not computed.

These three causes were responsible for more than half of all cases lasting longer than a week among male office employees during the two-year period. Accidental injuries were the leading cause of medical disability at ages 17-24 and at 25-44, while respiratory diseases ranked second in these age groups. At ages 45 and over, however, diseases of the circulatory system (mainly heart disease) were the leading cause. Diseases of the respiratory system and accidental injuries were also major causes of medical absences from work at ages 45 and over.

Among salesmen at ages 17-64, accidental injuries were also the most frequent medical cause of absence from work, followed by diseases of the circulatory system, digestive disorders, and diseases of bones and other organs of movement. More than three-fifths of all such medical absences among salesmen were attributed to these four disease categories. Accidental injuries led in frequency at ages under 55; at the oldest age group circulatory diseases ranked first, followed by diseases of the digestive system. The increased frequency from circulatory dis-

eases with advancing age was particularly pronounced: the incidence of new cases rose from five per 1,000 at ages 25-44, to 18 per 1,000 at ages 45-54, and to 42 per 1,000 at ages 55-64.

Pregnancy and maternity-related conditions were by far the most frequent medical cause of work absence among women. Ranking second were respiratory diseases among office employees and accidental injuries among sales employees. Among women office workers, pregnancy and related conditions led in frequency at ages under 45, while respiratory diseases led at the older ages. About one of every nine women aged 17-24 and one of every 13 women aged 25-44 who worked in the home and head offices missed work days in 1982-83 because of pregnancy. Among saleswomen, pregnancy and related conditions were the primary cause for absence from the job at ages under 45, while accidental injuries were the principal cause at ages 45-54, and diseases of the respiratory system at ages 55-64.

During 1982-83, women experienced higher rates of medically related work absences from respiratory diseases, genitourinary diseases, and neoplasms than did men. Men, on the other hand, missed work more frequently from circulatory diagnoses (particularly diseases of the heart) and accidental injuries. Men and women office personnel had higher rates of work days missed from respiratory diseases than did salespeople.

Commentary:
Recent Improvement in Metropolitan's Rate of Workdays Lost for Medical Reasons

Benefits for medically related workdays lost by Metropolitan's employees have been one of the more valuable features of the Company's Insurance and Retirement Program. Metropolitan remains committed to providing an appropriate level of replacement income during the period of medical disability (up to 26 weeks) while, at the same time, providing a financial incentive for a disabled person to return to work.

Effective organization and teamwork have been key factors in achieving the 8.5 percent decrease in the rate of medical disability from 1980-81 to 1982-83. An internal reorganization in the Human Resources Department in 1982 was an essential feature of this new program. At that time, a specialized unit was created to manage medical disability claims. Previously, medical expense and work loss claims had been jointly administered. Now equipped to focus solely on medical disability claims, this new unit can formulate and put into effect administrative procedures not previously feasible. These procedures, which require close liaison with other areas of the Human Resources Department and with the Medical Department, enable the Company to review more thoroughly initial claims and to closely monitor specific employees' cases.

Another part of the program that has, so far, produced modest results, but promises significant ones in the future, is the identification and implementation of individualized rehabilitation arrangements—tailored so that employees with extensive workdays lost can return to work. The success of this phase of our program will continue to depend greatly on the interaction between the Human Resources and Medical Departments; because of their respective roles in a thorough evaluation of each worker's specific circumstances.

In addition to the strengthened management of claims, the relatively stable work force at Metropolitan in recent years has undoubtedly contributed to the 8.5 percent improvement. Higher rates of short-term illness absence usually prevail among newly hired employees compared with men and women who have longer work records in the Company.

In conclusion, Metropolitan's recent medical disability experience has improved: organizational elements, some under direct management control (e.g., coordination of services, early rehabilitation efforts) and some not directly controlled (e.g., greater work force stability) are identifiable factors. In future studies, perhaps the specific results of their mutual contributions can be precisely estimated.

Joseph L. Rubsam
Mr. Rubsam is a Vice-President, Human Resources Department, Metropolitan Life Insurance Company.

CAPSULE BRIEFS

are timely literature selections with broad reader interest.

Atherosclerosis Prevention Starts in Childhood

The scientific evidence from epidemiology, clinical research, and experimental medicine powerfully links childhood dietary patterns to child and adult serum cholesterol levels, and thus to the major adult health consequence of this lipid state, coronary heart disease. This conclusion, as well as reams of scholarly support for it, emerged from a two-day conference, "Optimal Blood Lipids in Children," convened by the American Health Foundation in April 1983. (*Preventive Medicine*—entire issue—12:775-902, 1983)

The Egg and You

Just when we thought everything bad about egg yolks had been said, along comes another controlled study. It reports that egg yolks specifically increase the low-density lipoprotein fraction of serum cholesterol, the part most directly implicated in the atherosclerotic process in the arterial wall. The authors suggest that diets very low in cholesterol are more effective in reducing serum cholesterol levels than the moderate-cholesterol diets often recommended. (F.M. Sacks, *et al. Lancet* 1:647-649, March 24, 1984)

Later Looks Better

Women who delay childbearing to age 30 or later and have only 1-2 children, were found to have the highest standard of living and appeared better off economically at age 60 than all other women, according to a 1976 survey of 5,862 households. Total family assets, for example, appeared to be greater among those who delayed a first birth to age 30. (S.L. Hofferth, *Demography* 21:141-155, May 1984)

Alcoholism in Families: A New Clue

While the causes of alcoholism are complex, the disease frequently aggregates in selected families. In a study of 23 nonalcoholic male drinkers (21-25 years old) who had alcoholic close relatives (AR), subjects were matched by age, sex, and smoking habits with nonalcoholic drinkers without alcoholic close relatives. During testing with weight-determined alcohol dosages, the ARs experienced fewer subjective feelings of intoxication in the two hours after peak blood alcohol concentration, especially at a lower dose. Thus, ARs may need greater alcohol dosage (ergo, greater exposure and higher risk) to achieve an intoxicated effect. (M.A. Schuckit, *Archives General Psychiatry* 41(9):879-884, 1984)

Childhood Diseases: Day Care a Culprit?

New childhood disease patterns are emerging in America. Infants and preschoolers seem to acquire certain infectious diseases at earlier ages, and their parents have increasingly greater exposure to agents like hepatitis A, cytomegalovirus, and various diarrheal microbes than previously. Experts believe that increasing use of day care centers abets the problem; e.g., in Minnesota (1983) 50 percent of the 300,000 total preschool population were regular day care attendees. The problem is growing. Its full public health consequences, however, are yet unknown. (Medical News, *Journal of American Medical Association* 251(10): 1245-1251, 1984)

Heroin-Use Epidemic: Grim Facts

Occasionally, an incidental research finding can shock us into a keener awareness of a public health problem. Here is one. In an autopsy study of 253 heroin-related deaths in Washington, D.C., even matched controls had readily measurable levels of morphine (a heroin derivative) in their bile and urine samples as well as quinine (the "cutting" substance of street heroin) in the lung tissue sampled. An epidemic condition surely exists in our capital city, as the authors observed. (A.J. Ruttenber and J.L. Luke, *Science* (226): 14-20, 1984)

Down in the Mouth

Quietly and virtually unnoticed nationally, American dentistry has fallen upon hard times. Since the mid-1970s dentists' adjusted incomes have steadily declined while the costs of starting a new practice have risen dramatically. Dental school applications are sharply down. A national excess of dentists also exists. (R. Greene, *Forbes* 79-84, August 13, 1984)

Running Out of Bone

Amenorrhea is a recognized medical problem in women athletes and ballet dancers. Now it has been found that a group of women long-distance runners (67.3 km per week) with amenorrhea had significantly lower lumbar vertebral bone density compared with carefully matched age-sex-runner controls (40.1 km per week). These differences portend greater risk of earlier and/or more severe osteoporosis among amenorrheics in later life. (B.L. Drinkwater, *et al, New England Journal of Medicine* 311(5): 277-280, 1984)

From age 25 to 64 American men and women make many personal decisions with far-reaching societal implications: career choice, marriage, family formation, housing, insurance, financial security, health behavior, medical care utilization and election participation. This age group constitutes one of our nation's most important resources. Their demography, presently and as projected into the 21st century, vitally affects the entire country's future.

By the year 2000 this economically productive age group—25-64—is expected to increase by one-fourth or from 114,387,000 to more than 141,000,000. Moreover, projections indicate that their total will continue climbing to a peak of 153,700,000 in 2020. It is expected that persons aged 25-64 will probably decline slightly in number before resuming an upward trend, reaching 151,600,000 in 2050.

Table 1 describes this imporant population group by sex and age. As shown, in total, men are outnumbered by women, but the difference is projected to narrow with the passage of time. Thus, whereas there were 2.6 million more women than men aged 25-64 in 1983 (58.5 million versus 55.9 million), by 2050 the disparity is expected to be reduced to only 0.2 million (75.9 million versus 75.7 million). As a result of the more rapid increase in the number of men, the ratio of females per 100 males will decrease from almost 105 in 1983 to about 100 in 2050. Figure A shows the recent trend and likely projections of the sex ratio of adults aged 25-64 by age group.

Male/Female Ratios

Of the three age brackets analyzed, the 45-64 age group will experience, by far, the most rapid increase. The number of men at these ages will rise by nearly three-fourths between 1983 and 2050—from 21,195,000 to 36,709,000. During the same time, the number of women at these ages will increase from 23,367,000 to 37,612,000 or by three-fifths. As a consequence, the number of women will exceed men by less than 1 million in 2050 and as can be seen in Figure A, the sex ratio will sharply decline from 110 females per 100 males in 1983 to 102 per 100 males by the mid-part of the 21st century.

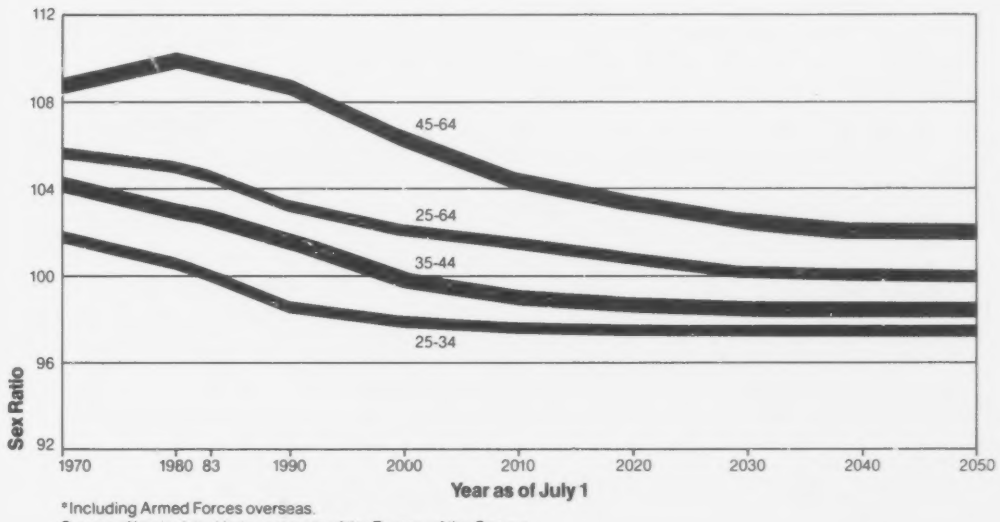
Currently there are more women than men aged 35-44. However, the number of men is expected to reach parity with women by the turn of the century. For example, there were 14,961,000 women in 1983 compared with 14,531,000 men. By 2000 the number of men aged 35-44 will reach 21,866,000 while their female counterparts are expected to total 21,877,000. After the year 2000, projections indicate that the number of men will be in the majority— albeit slightly— with the sex ratio remaining at 99 females per 100 males.

"After the year 2000, projections indicate that men will be slightly in the majority, with the sex ratio remaining at 99 females per 100 males."

A significantly different pattern is anticipated for the population aged 25-34. There is likely to be fewer persons at these ages in 2050 than at present. The number of females at these ages is expected to decline by 6 percent in the period under review—from 20,181,000 in 1983 to 18,965,000 in 2050. Men aged 25-34 will also experience a diminution in their number—approximately 4 percent—to 19,418,000 in 2050. In 1983 females barely outnumbered males, with the sex ratio at these ages being 100 females for every 100 males. In the foreseeable future the ratio is expected to fall slightly to 98 females per 100 males and remain at this plateau.

Figure B is a visual summary of the expected changes in the three component age groups of the adult population. As can be determined, in 1980, persons 45-64 constituted over two-fifths of the entire age bracket, while men and women aged 35-44 comprised about one-fourth, and those aged 25-34, more than a third. By the year 2000 the 25- 34-year-olds proportion of the total will probably decline slightly to around one-fourth and remain at this level through 2050. On the other hand, the number of men

Figure A–Trend in Ratio of Females per 100 Males Aged 25-64*
United States, 1970-1983 and Projections to 2050



*Including Armed Forces overseas.
Source of basic data: Various reports of the Bureau of the Census.

and women aged 45-64 will initially experience a small decline in their relative importance, but then increase to virtually half of the entire 25-64 age group. Persons 35-44 years of age comprised 26 percent of the total in 1983 and their proportion is expected to increase to 31 percent in 2000 before receding to the 1983 level by 2050.

"Over the entire age range from adult life to retirement, the vast majority of men live in a family setting—most with their wives."

Characteristics

In March 1983, 88 percent of the males aged 25-64 and 86 percent of the females were white. For each successive age group in the study, the percentage of whites increased and was consistently slightly higher among males than among females.

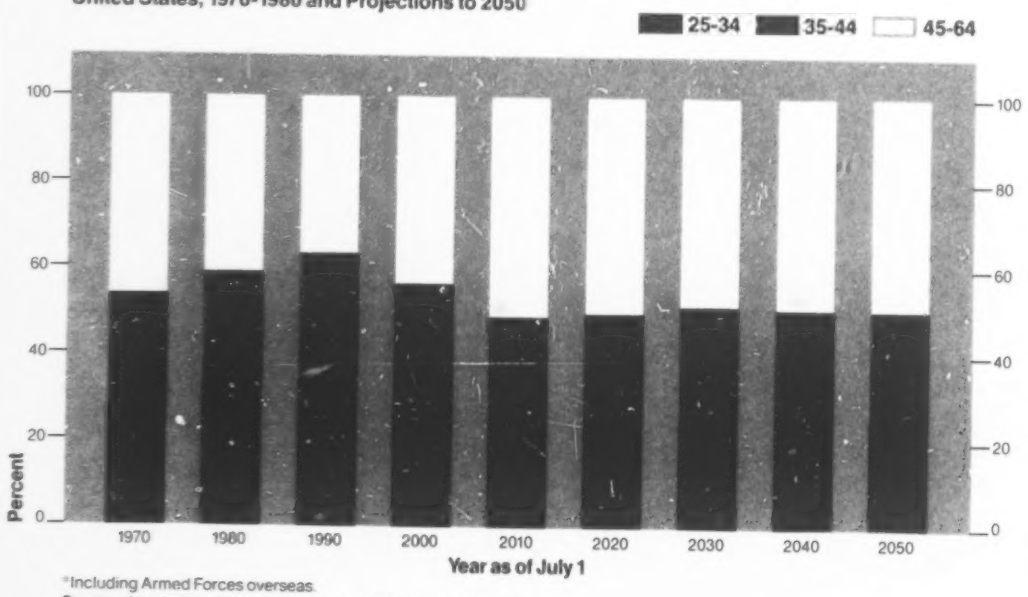
Marital Status

Reflecting the recent changes in marital patterns of American men and women, nearly 30 percent of the men 25-34 years of age were single in March 1983 compared with just 16 percent in April 1970. Among females in this age group the proportion of unmarrieds also doubled, rising from 10 percent in 1970 to 19 percent in 1983. In aggregate, one-seventh of the men and one-tenth of the women were single.

Notwithstanding, approximately three-fourths of the men and women aged 25-64 were married. The relative number of married men rose sharply with advance in age, but the corresponding increases among females were not so pronounced. About 10 percent or less of the men and women 25-64 were divorced.

"Not unexpectedly, 90 percent of the men are in the labor force with the vast majority gainfully employed."

Figure B–Trend in Percentage Distribution of Population Aged 25-64*
United States, 1970-1980 and Projections to 2050



*Including Armed Forces overseas.
Source of basic data: Various reports of the Bureau of the Census.

Education

Men and women aged 25-64 have continued to improve their educational attainment. Over three-fourths have at least a high school education and, as a group, about one-fifth have completed four or more years of college. Among persons 25-34 years of age, just 13 percent of the males and almost the same proportion of females did not attain a high school degree, while over one-fourth of the males and one-fifth of the females graduated from college. At ages 35-44 the relative numbers with a college degree rose fractionally for men but decreased somewhat for women. Even at ages 45-64 one-fifth of the men have a college diploma and almost an additional 50 percent completed high school or had some college training. For females at these ages 10 percent could claim a college degree and nearly another three-fifths had finished high school or one to three years of advanced schooling.

Employment

Not unexpectedly, 90 percent of the men are in the labor force with the vast majority gainfully employed. Another reflection of our changing times is the growing proportion of women in the labor force. In April 1970 less than half of the women 25-64 were working or seeking employment whereas currently the proportion is over three-fifths. Nearly seven-tenths of the women at ages 25-44 were in the labor force and even at ages 45-64 the proportion was over half.

Lifestyle

Over the entire age range from early adult life to retirement, the vast majority of men live in a family setting—most with their wives. Among women, approximately nine-tenths reside in a family situation—the proportion remained fairly constant throughout the three age groups. Of those men and women who did not live with their own relatives, most

maintained their own household or resided with non-relatives—relatively few dwelt in an institutional environment.

"In aggregate, one out of six women earn their living as service workers."

In 1980 more than one-fourth of the men aged 25-64 were employed in managerial or professional positions. In addition, over one-fifth reported their occupations as precision, production, craft, and repair specialist, and a similar number were operators, fabricators and laborers. Almost the same relative number of women aged 25-64 were working in managerial or professional jobs. However, the proportion of women employed as technical, sales, and administrative support workers was more than twice that of males—over two-fifths compared with less than one-fifth. In aggregate, one out of six women earned their living as service workers. Details of the current characteristics of men and women are presented in Table 2 on page 24.

Table 1—Population Aged 25-64

United States—1970-2050

Year As of July 1	Male Ages 25-64	Male Ages 25-34	Male Ages 35-44	Male Ages 45-64	Female Ages 25-64	Female Ages 25-34	Female Ages 35-44	Female Ages 45-64
				NUMBERS IN THOUSANDS				
1970	43,945	12,537	11,322	20,086	46,527	12,787	11,828	21,912
1980	52,620	18,727	12,730	21,163	55,366	18,874	13,156	23,336
1983	55,880	20,154	14,531	21,195	58,509	20,181	14,961	23,367
1990	62,845	21,892	18,732	22,221	64,984	21,637	19,116	24,231
2000	69,718	18,384	21,866	29,468	71,326	18,031	21,877	31,418
2025	75,140	19,370	20,113	35,657	75,631	18,926	19,887	36,818
2050	75,665	19,418	19,538	36,709	75,885	18,965	19,308	37,612
				PERCENT DISTRIBUTION*				
1970	100.0%	28.5%	25.8%	45.7%	100.0%	27.5%	25.4%	47.1%
1980	100.0	35.6	24.2	40.2	100.0	34.1	23.8	42.1
1983	100.0	36.1	26.0	37.9	100.0	34.5	25.6	39.9
1990	100.0	34.8	29.8	35.4	100.0	33.3	29.4	37.3
2000	100.0	26.4	31.3	42.3	100.0	25.3	30.7	44.0
2025	100.0	25.8	26.8	47.4	100.0	25.0	26.3	48.7
2050	100.0	25.7	25.8	48.5	100.0	25.0	25.4	49.6
				PERCENT CHANGE				
1970-1980	19.7%	49.4%	12.4%	5.4%	19.0%	47.6%	11.2%	6.5%
1983-1990	12.5	8.6	28.9	4.8	11.1	7.2	27.8	3.7
1990-2000	10.9	-16.0	16.7	32.6	9.8	-16.7	14.4	29.7
2000-2025	7.8	5.4	- 8.0	21.0	6.0	5.0	- 9.1	17.2
2025-2050	.7	.2	- 2.9	3.0	.3	.2	- 2.9	2.2
1983-2000	24.8	- 8.8	50.5	39.0	21.9	-10.7	46.2	34.5
1983-2050	35.4	- 3.7	34.5	73.2	29.7	- 6.0	29.1	61.0

*Percent of population aged 25-64.

Source of basic data: Various reports of the Bureau of the Census.

Table 2—Characteristics of United States Population Aged 25-64

Characteristics	Percent Distribution							
	Male				Female			
	Ages 25-64	Ages 25-34	Ages 35-44	Ages 45-64	Ages 25-64	Ages 25-34	Ages 35-44	Ages 45-64
Race*	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White	87.7	86.4	87.8	88.9	85.8	84.0	85.3	87.7
All other	12.3	13.6	12.2	11.1	14.2	16.0	14.7	12.3
Marital Status*	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Single	14.7	29.4	8.6	5.1	10.0	19.2	6.3	4.4
Married	76.8	63.3	81.9	86.0	74.2	70.5	78.6	74.6
Widowed	1.0	.1	.3	2.2	5.6	.6	2.1	12.0
Divorced	7.5	7.2	9.2	6.7	10.2	9.7	13.0	9.0
Family Status*	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
In families	84.4	78.2	86.3	89.0	88.2	87.2	92.9	86.1
Householder	72.2	57.6	77.1	82.3	15.6	15.2	19.1	13.8
Married, spouse present	69.4	55.5	74.0	79.3	2.9	3.3	3.2	2.5
Spouse of householder	3.2	3.2	3.5	3.1	66.1	61.1	70.0	68.0
Other	9.0	17.4	5.7	3.6	6.5	10.9	3.8	4.3
Not in families	15.6	21.8	13.7	11.0	11.8	12.8	7.1	13.9
Householder	12.1	15.7	11.1	9.3	9.7	9.3	5.5	12.8
Other	3.5	6.1	2.6	1.7	2.1	3.5	1.6	1.1
Labor Force Status†	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
In labor force	89.5	94.7	95.3	81.0	61.3	68.0	68.0	51.6
Employed	82.7	85.2	88.8	76.5	56.8	61.7	63.2	48.7
Unemployed	6.8	9.5	6.5	4.5	4.5	6.3	4.8	2.9
Not in labor force	10.5	5.3	4.7	19.0	38.7	32.0	32.0	48.4
Educational Attainment†	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1 year of high school	10.9	4.4	9.1	18.0	9.8	4.4	7.5	15.8
1-3 years of high school	11.8	8.7	10.8	15.4	13.2	9.0	13.0	16.1
4 years of high school	36.3	38.6	36.0	34.4	44.8	43.4	45.6	45.5
1-3 years of college	17.1	21.8	17.3	12.6	16.4	21.1	16.6	12.3
4 or more years of college	23.9	26.5	26.8	19.6	15.8	21.2	17.3	10.3
Occupation Group of Employed‡	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Managerial and professional specialty	27.2	25.9	29.7	26.8	24.7	28.0	25.1	21.0
Technical, sales and administrative support	18.8	19.5	18.0	18.7	43.5	44.5	42.8	42.9
Service occupations	7.4	7.3	6.6	7.9	16.1	13.7	15.8	18.9
Precision, production, craft and repair	21.7	21.5	21.9	21.7	2.5	2.3	2.6	2.7
Operators, fabricators and laborers	21.1	22.6	20.5	20.2	12.3	10.8	12.7	13.4
Farming, forestry and fishing	3.8	3.2	3.3	4.7	.9	.7	1.0	1.1

*As of March 1983. †As of March 1982. ‡As of April 1, 1980.

Note: Data for labor force status and educational attainment relate to the noninstitutionalized population.

Source of basic data: Various reports of the Bureau of the Census and the Department of Labor.

The American life and health insurance industry began the INSURE Project in 1980 to study how age-related preventive services--including patient education for health risk reduction--could be implemented in private physicians' offices, what would be the cost of such a program, and whether or not these services would have any impact on medical care cost containment.

Funding for the INSURE Project began with contributions from nine insurance companies and has now expanded to 28 companies for a total of $750,000 over three years. The Robert Wood Johnson Foundation and the John D. and Catherine T. MacArthur Foundation have made grants totaling $500,000 bringing the total project budget to $1.25 million for three years.

The specific objectives of the study were as follows:

1. **To define age-specific preventive health services at sites involving primary care physicians in group practice.**
2. **To develop medical protocols and educational materials for the participating physicians to promote preventive services among their patients.**
3. **To evaluate the initial effects of preventive care on physicians and patients.**
4. **To determine the costs of these services.**

The INSURE Project has been implemented at three private, fee-for-service group practice sites in: Appleton, Wis.; Danville, Pa.; and Pensacola, Fla. At control sites in Sheboygan, Wis., and Sayre, Pa., data on preventive services were also collected for comparison purposes, but study protocols were not used.

This is a summary of a report by Matthew Rosen and Donald Logsdon.

An age-specific prevention examination cost an average of $73 according to data from 1,645 patients examined at 3 study sites during 1981-83 in Wisconsin, Pennsylvania and Florida. The cost was based on a negotiated payment schedule for usual and customary physicians' fees including their time for patient education, medical history, physical exam, laboratory, and radiology services. The complexity of services and their charges ranged by patients' age from $38.07 for 2-5-year-old children up to $139.90 for adults 60-74 years old. The direct costs for these examinations were less than expected because a fee schedule was used, and many unnecessary tests such as routine chest X-rays and electrocardiograms were excluded.

Utilization of Services

Utilization among the various age groups averaged about 38 percent. The utilization rate was defined as the percentage of the eligible sample who received an examination. Interestingly, this observation suggests that even when patients are provided with "first-dollar" insurance coverage for prevention, pre-

ventive care utilization rates may not be excessive in clinical care populations. The utilization rate for pregnant women was 12 percent, lowest among any group, probably because many of them were already receiving routine prenatal (i.e., preventive) examinations.

Patient Perceptions

In order to collect financial baseline data about preventive services, patients were asked questions regarding their current insurance coverage as well as their attitude towards prevention service coverage. It was found that 93 percent of responding patients had some form of health insurance, most (76 percent) having group coverage. Nearly four-fifths of respondents, however, reported that they did not have coverage for preventive services.

Almost three of five respondents (58 percent) reported they were "very interested" in coverage for preventive services. When added to those persons who were "somewhat interested," more than 86 percent of the respondents expressed interest in coverage for preventive services as part of their health insurance. It was concluded from these preliminary

"An age-specific prevention examination cost an average of $73 according to data from 1,645 patients."

data that a strong demand (or market) may exist for insurance coverage for preventive services, even if it is not a fully utilized benefit.

Interest in coverage for preventive services extended beyond free services. More than three-fifths of respondents stated that they would pay $5 a month or $60 a year for coverage for prevention. These data from the three sites of the INSURE Project indicated that a demand exists for preventive services, and that the average acceptable charges to persons are close to what Project INSURE's patients costs were, i.e., $73 per exam and $60 per year for extra premium. The patients also reported that coverage for preventive services was more desirable than other health insurance benefits; these benefits are frequently provided in addition to basic hospital and medical expenses, and include dental coverage and prescription drugs.

Data from the INSURE Project are not yet available on the estimated impact of preventive services on disease care cost containment. However, the project has begun to define the appropriate methodology and to collect the necessary data by involving an employer, employees, providers and insurance carriers to study the impact of preventive services on health insurance claims experience. The issue of cost containment will also be addressed in more detail in the next phase of the project.

Insurance for Prevention

A logical "next step" regarding preventive services in primary care is a pilot study involving several employer groups in diverse U.S. regions plus their insurance carriers. Among some of the practical issues that require attention in such a pilot study would be how to gain widespread physician participation, and how to process and evaluate insurance claims. Such practical problems may seem large, but through cooperation with the health insurance industry, workable solutions are expected to emerge. For example, insurance industry actuaries, after reviewing the INSURE Project data analyses believe

"Even when patients are provided with 'first dollar' insurance coverage for prevention, preventive care utilization rates may not be excessive in clinical care populations."

that the premiums for a preventive services rider to group health insurance should be relatively inexpensive—i.e., as little as an additional five to 10 dollars a month.

It is likely that a new delivery system designed to control medical care costs, such as preferred pro-

vider organizations (PPOs) or health maintenance organizations (HMOs) may be especially well-suited to implement our age-related model of preventive services as an insurance benefit. With costs consciousness among American corporations at an all-time high, a health insurance benefit program that would enable employees to use preventive services should also contribute to efficiency in the human resources area of business.

In summary, preliminary results from the INSURE/Lifecycle Project suggest that an age-related model of preventive services is feasible in primary care, that costs appear controllable and that utilization seems predictable. In addition, the study findings to date

"A new delivery system to control medical care costs—preferred provider organizations or health maintenance organizations—may be well-suited to implement this model of preventive services as an insurance benefit."

support the opinions of many leaders in the field of health promotion and health policy: preventive services and health promotion have considerable potential to decrease health care costs, and also to improve the health of the American public.

Matthew A. Rosen, Ph.D., is Associate Director of the INSURE Project and Adjunct Assistant Professor of Public Health, Division of Socio-medical Sciences at Columbia University.

Donald N. Logsdon, M.D., is Director of the INSURE Project and Assistant Clinical Professor, Department of Community Medicine at Mt. Sinai School of Medicine of the City University of New York.

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Coming in Future Issues

- State Population Projections by Age
- Accident Mortality Among Working Men
- Diagnosis Related Group (DRG) Variations by Region
- Costs of Coronary Bypass Surgery
- International Variations in Cardiovascular Mortality

Historical Perspectives

20 YEARS AGO

IN THE **1965** STATISTICAL BULLETIN

In 1964 one in 11 male and one in 13 female Metropolitan Life employees were hospitalized. Among men, surgical cases outnumbered the nonsurgical by a moderate margin, and only at ages under 45, whereas among women, surgical cases had twice the frequency in the working ages. Among men, abdominal and "general surgery" accounted for about one-fifth of surgery admissions. Among women, gynecological and "general surgery" each accounted for over one-fourth of the surgical cases. The longest hospital stay for both sexes was necessitated by psychoneuroses and psychoses (an average of 26 and 60 days for men and women, respectively) (Page 8, June)

The trend in accident deaths among babies under one year was analyzed for the period 1952-62. Accidents took more lives of infants annually in the United States than at any other single year of age. The toll in infancy was from two to four times that in any of the preschool ages. Progress in reducing the accident death rate among infants in the decade was limited to the first 28 days (neonatal period), in which the rate fell from 17.7 per 100,000 live births in 1952 to 12.2 in 1962, or about a third. Airway obstruction or suffocation ranked first as a cause of death, closely followed by mechanical suffocation from bedclothes or pillows. With the exception of drowning accidents, infant boys recorded higher death rates than girls. (Page 7, March)

Metropolitan statisticians presented a profile of the American woman of the 1960s and reported that the number should exceed 81½ million by July 1980 (official total was 85,729,000—ed.) At ages 18-19, 30 percent were married and the proportion rose to seven-eighths by ages 25-29. Past midlife the proportion married decreased as the number of widows increased. Only about 40 percent of the women over 18 were in the labor force and half of these were employed as service and private household workers or clerical and kindred workers while almost 20 percent were professional, technical or managerial workers. The educational attainment was relatively high—two-thirds under age 30 were at least high school graduates while most others at this age had one to three years of high school. On the other hand, of the women over age 65, only one-fourth had completed high school and nearly two-thirds had less than one year of high school. (Page 1, February)

The American male continued to improve his educational attainment. In 1960 one of seven men aged 25-29 was a college graduate, twice the proportion at ages 65 and older. Conversely, the proportion with less than one year of high school increased from one-fifth among men in their late 20's to nearly two-thirds among those aged 65 and over. Blue-collar workers had the greatest improvement in educational attainment during the decade. In 1960, 27.1 percent of farmers and farm managers were at least high school graduates, compared with 16.2 percent in 1950. (Page 1, June)

Metropolitan examined the mortality trend in 19 countries of the Western world between 1950 and 1960 and found that the countries with traditionally low mortality, mainly those in Western Europe and other English-speaking countries, had further reduced their death rates. As usual, females experienced lower death rates than males. For men, eight countries had more favorable death rates than that for white men in the United States while, for women, the rate in the United States was surpassed by only four countries. The decline in mortality prior to midlife in Western Europe and the English-speaking countries was attributed to the control over infectious diseases and the advances in medical and surgical techniques. (Page 1, August)

Metropolitan reported that 70.6 million Americans voted in the 1964 Presidential election—an increase of 1.8 million over the number in 1960. However, the civilian population of voting age had increased by nearly 5 million, indicating a decrease in the proportion of the population that voted. By state, 35 of the 50 states—all the northeastern and midwestern states, and a majority in the Mountain and Pacific divisions—showed a decrease in the proportion voting. However, most of the south and southwestern states showed increases. In 1964 the voter participation ranged from a low of 33.3 percent in Mississippi to a high of 77.3 in Utah. (Page 3, September)

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10 **Workdays Lost After Coronary Bypass Surgery.** A six-year follow-up of work loss experience among Metropolitan Life employees.

15 **Examining the True Costs of Coronary Bypass Surgery.** Commentary by Philip Briggs, Executive Vice-President, Metropolitan Group Department.

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Metropolitan Life
AND AFFILIATED COMPANIES

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From The Editor's Desk

In this issue, we unveil a new editorial emphasis—medical care utilization and costs—using data derived from Metropolitan's group health insurance claims for coronary bypass surgery. That is, physician and hospital charge and utilization data analyzed by geographic divisions of the United States. In making this addition, *Statistical Bulletin* wants to promote greater interest in the potential uses of group insurance data for revealing differing measurements of medical care. We hope that these analyses can become important contributions to future public discussion among physicians, hospitals, consumers and insurers. In the next two issues you will read more about geographic variations/trends in hospital care.

Words of Thanks

Considerable credit is due to those individuals handling claims data analyses for Metropolitan. At the risk of slighting some colleagues, I wish to mention one special group that has materially contributed to these analyses: Corporate Health Strategies.

Corporate Health Strategies (CHS) has been a subsidiary of Metropolitan's since 1983. It was founded in 1981 by Rob Chernow and Dennis Dang, who were members of the team at Yale University that developed the diagnostic related group (DRG) technology. Since 1983, this technology has provided the analytical basis for the prospective payment system used by Medicare in its hospital reimbursements.

CHS's computer software technology was responsible for the data reduction within Metropolitan's group health book of business that made (and will continue to make) possible these analyses of claims data like those in the article about coronary bypass costs. *SB* anticipates a productive relationship with CHS in medical care analyses.

While extending credit to colleagues, I wish not to overlook another, Norbert Smith, a staff member of the Claims Planning and Policies Division. Through his efforts, the cohort of Metropolitan employees having coronary bypass surgery was followed up for an average of six years. (The disability experience of some employees was tracked for as long as 10 years.) *SB's* article was made possible because of the care with which Norbert Smith collected the data, assembled them into a data base, and produced the preliminary analyses.

Also in This Issue

Cardiovascular diseases remain the Western world's major health problem. They can be cruelly swift in initial physical manifestations when the first symptom is stroke or cardiac arrest. Internationally, progress has been made in reducing their mortality rates, as *SB* shows this month. However, despite the impressive reduction in the age-adjusted cardiovascular death rate since 1968 in the United States (over 30 percent decline), this country still has a much higher mortality than our European neighbors. These differences between the continents, and among the countries, are worth reviewing. Are there new clues to heart and vessel disease prevention (e.g., related to culture) lurking there? Perhaps so.

Until next time, I wish you good reading. □

Charles B Arnold

Costs of Coronary Bypass Surgery

Coronary artery disease is the leading cause of death and a major cause of disability in the United States. Despite preventive efforts and medical therapies, it remains a major medical care problem for many Americans and their employers. Since 1967, cardiovascular surgeons have used a technique to interpose a vein graft "bypassing" the arterial obstruction in coronary arteries which is believed to be the principal cause of heart attacks. As surgeons have increased in number and in technical skill, so have the number of bypass operations. A federal report estimated that 191,000 coronary bypass surgeries had been performed in 1983.

Metropolitan statisticians estimate that American business and industry, through its group health insurance coverage, pays for most (perhaps 75 percent) of these procedures. In the next two articles *SB* examines two aspects of this remarkable medical care situation.

In the first article "Significant Regional Variations in Charges for Bypass Surgery," *SB* analyzes the dollars paid to physicians and hospitals (including room and board, as well as ancillary charges) plus lengths of stay among Metropolitan group health customers during 1982-83 in the geographic divisions of the United States. Not surprisingly, the expense of these surgeries to businesses depends greatly on geographical location.

This analytical study is the first of a new series by *SB* on the charges for medical care by hospitals and physicians for common procedures in the United States. These articles will be the result of teamwork by *SB*, Corporate Health Strategies (a Metropolitan subsidiary), and members of Metropolitan's Group Health Insurance staff.

In the second article on coronary bypass surgery, *SB* analyzes the work loss experience among a small cohort (147) of Metropolitan Life Insurance Company employees who had this procedure during the period 1974-78 and who were followed for an average of 4.9 years. As *SB* estimates in the article, if the Metropolitan experience is typical, the costs to American business in work lost are greater than the surgical procedural costs.

In the companion editorial, Philip Briggs, Executive Vice-President, Metropolitan Life Insurance Company, discusses the need to reassess the cost-effectiveness of coronary bypass procedures, and asks, in effect, whether there are wiser uses of these dollars within the medical care system than this surgery. Further, he estimates (conservatively) that unnecessary bypass surgery may have cost American business $300 million in 1983. □

The Editors

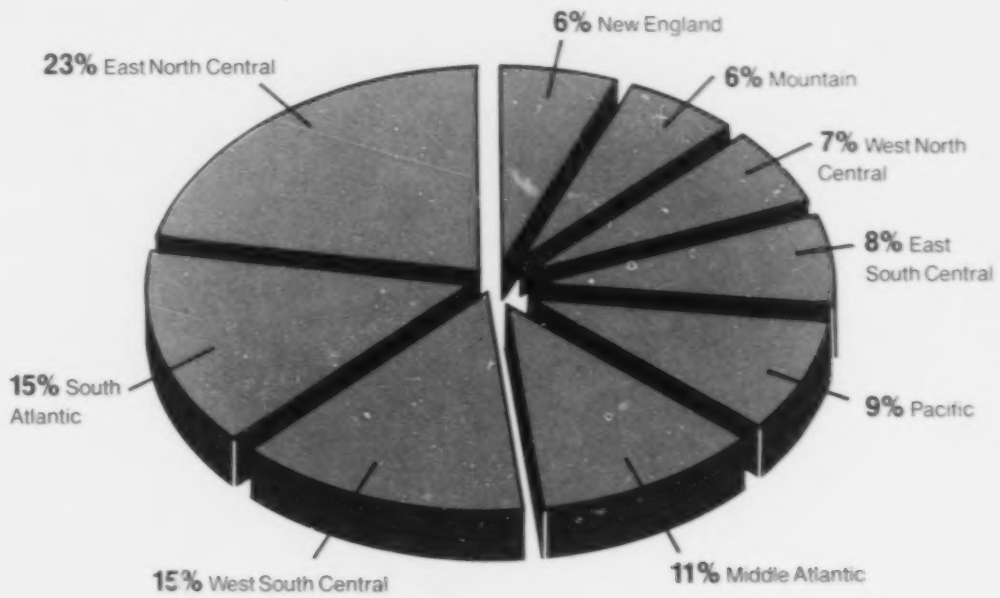
David Johnson

Significant Regional Variations in Cost of Coronary Bypass Surgery

The average medical care charges in the early 1980s for a coronary bypass operation in the United States were $21,800; however, there was as much as a 228 percent variation by state. Physician charges averaged $6,400 and also showed extensive geographic variations. These are the results of an analysis of 3,088 operations performed between January 1982 and July 1983 on employees of companies insured under group health contracts by Metropolitan Life Insurance Company. The average charges described in this article represent billed amounts for hospital charges and surgical and medical physician fees (excluding anesthesiologists and radiologists) for DRGs 106 and 107. Charges for other medical care (e.g., aftercare or tests conducted outside the hospital) are not included in these figures.

A brief profile of these surgical patients showed that 2,546, or 82 percent were male and 542, or 18 percent were female. Additionally, more than half--56 percent--were 55-64 years of age at the time they entered the hospital, another 34 percent were aged 45-54, and 10 percent were under 45 years of age.

Figure A—Percentage Distribution of Coronary Bypass Cases by Geographic Division of the United States, Jan. 1982-July 1983

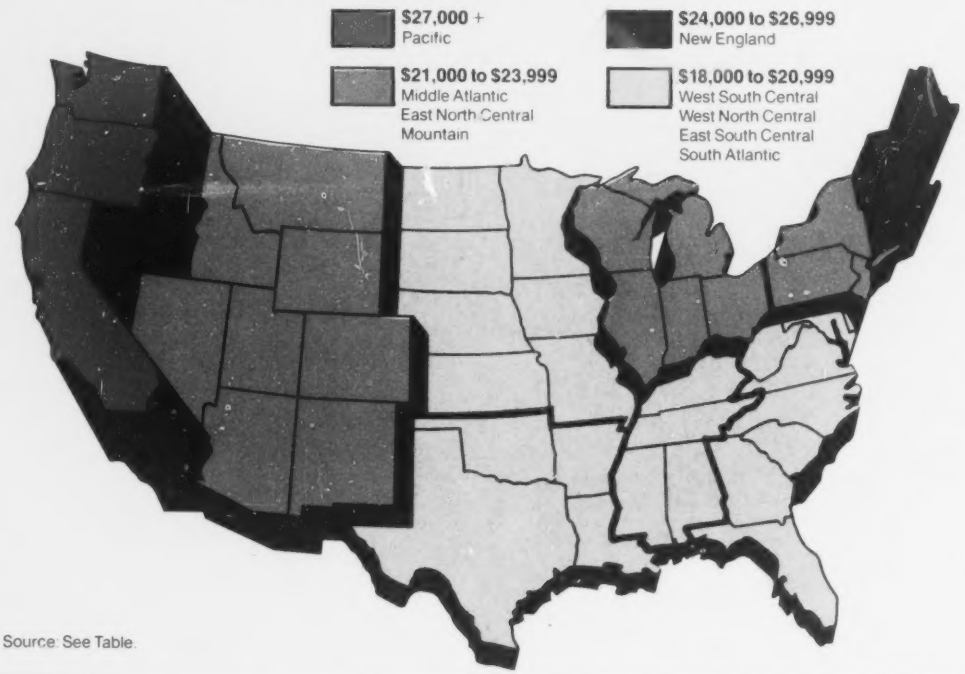


Source: See Table

Figure A presents the relative geographic distribution of the place of occurrence of the operation. As shown, over half of the number of coronary bypass procedures were performed in three of the nine divisions of the country—East North Central (23 percent), South Atlantic and West South Central (15 percent each). Another 11 percent of the operations took place in the Middle Atlantic division of the country, with an additional 9 percent occurring in the Pacific states (the vast majority in California).

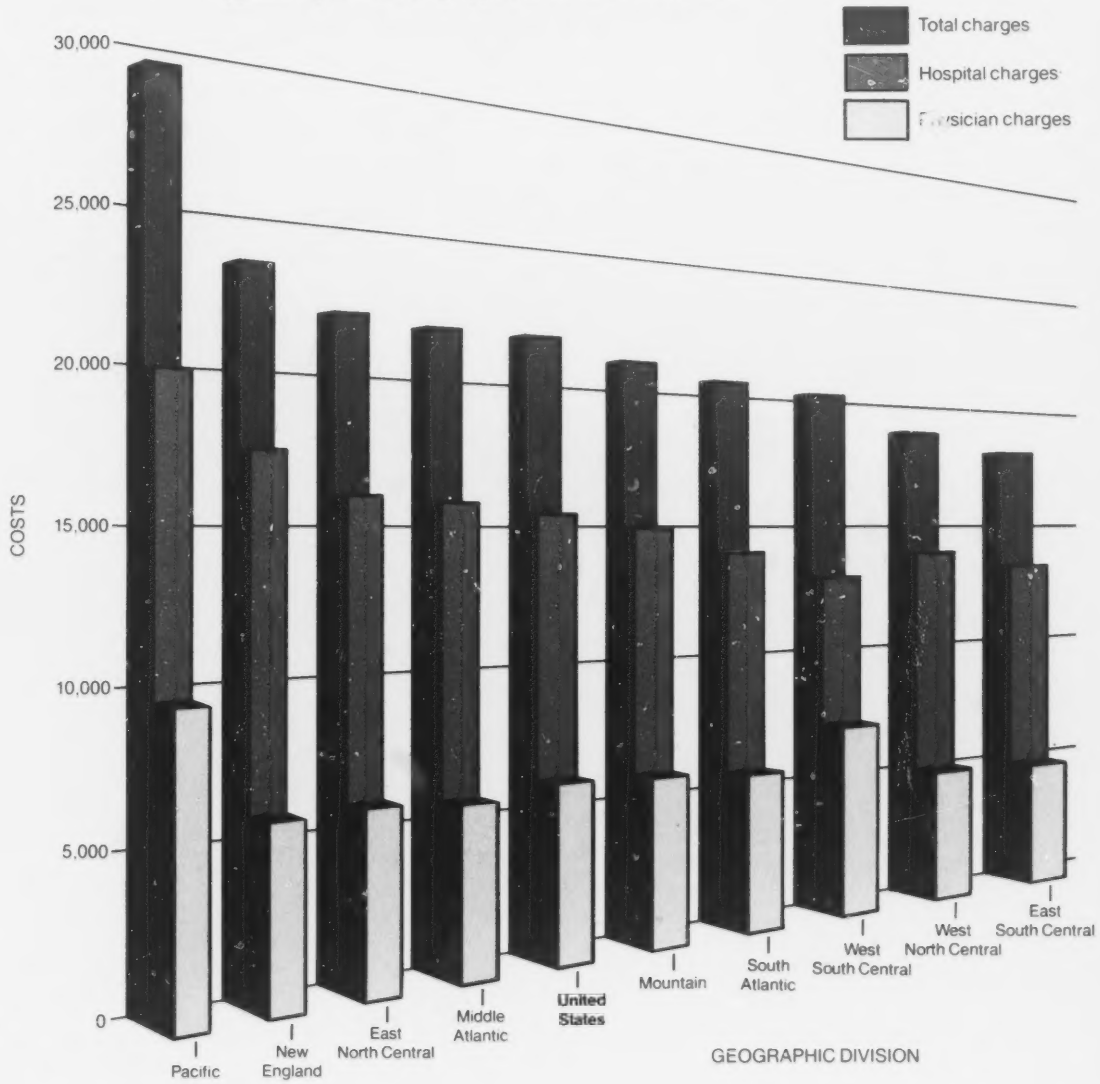
The costs of the surgery varied greatly by geographic division of the country, as shown in Figure B. The highest average charge for a coronary bypass operation was recorded in the Pacific division—namely, $29,500. Next in rank order was the New England division ($23,500), followed by the East North Central states ($22,100), and then the Middle Atlantic area of the country ($21,800). The five remaining geographic divisions reported average costs below the national total, with the lowest amount occurring in the East South Central states—$18,300.

Figure B—Coronary Bypass Operation Charges by Geographic Division, Jan. 1982-July 1983



Source: See Table.

Figure C—Geographic Distribution of Charges for a Coronary Bypass Operation, by Type, Jan. 1982-July 1983



Source: See Table.

Cost Variations by State

States, too, varied substantially in their charges for surgery. On a state-by-state basis, the highest total charge for a coronary bypass operation was reported in California and the lowest was experienced in Kentucky—namely, $30,800 and $13,500, respectively, or a difference of 228 percent. In this study the *Statistical Bulletin* shows data only for those 12 states in which 100 or more cases were reported (as a group they comprised 65 percent of all cases). (See table on page 8.)

The highest total charge for a coronary bypass operation was reported in California; the lowest, in Kentucky.

The average total charge for the coronary bypass operation in California was more than 40 percent higher than for the United States average. Other states with comparably high charges were Massachusetts, Illinois and Pennsylvania. No other state experienced costs 10 percent or more above the national total. It is interesting that in New York the average charge for the operation was just three-fifths of that in California and 10 percent below the average for the United States. Besides Kentucky, patients who had their operations in Mississippi, Iowa, Georgia and Maryland received relatively smaller bills—$15,100, $16,400, $17,400 and $17,600, respectively.

Physician and Hospital Charges

Figure C presents, for each of the geographic divisions, the total charges for coronary operations subdivided into physician and hospital charges. On the average, 71 percent of the total cost to health insurance for a coronary bypass operation was attributable to hospital charges (i.e., room and board and ancillary fees). By state, these percentages ranged from highs of 78 percent in Massachusetts and 77 percent in Pennsylvania to a low of 63 percent in Texas.

Proportionate charges by hospital and physician varied widely by state as well. The total amount of the hospital bill was at least 20 percent above the United States average in Massachusetts, California, Illinois and Pennsylvania. On the other hand, in Texas the average hospital charge for room and board and ancillary fees was almost 20 percent below the national figure.

In New York the average charge was three-fifths of that in California and 10 percent below the average for the United States.

It is noteworthy that ancillary charges comprised 79 percent of the total hospital billings. Ancillaries include laboratory, electrocardiography, X-ray, operating room charges, blood bank, respiratory therapy and the like. Geographically, these charges typically ran three to four times the costs of room and board. However, in some states, the costs ranged from

Regional Variations in Hospitalization Costs of Coronary Bypass Operations Personnel of Group Health Customers of Metropolitan Life Insurance Company, Jan. 1982-July 1983

Geographic Area	Cases		Average Cost ($)					Average Length of Stay	Percentage		
			Total Hospital & Physician	Hospital Charge			Physician Charge		Total Cost		Hospital
	Number	Percent		Total	Room & Board	Ancillary			Hospital Charge	Ancillary Charge	Ancillary Charge
United States	3,088	100	**21,800**	15,400	3,300	12,100	6,400	13.65	71	56	79
New England	182	6	**23,500**	17,500	4,300	13,200	6,000	14.52	74	56	75
Massachusetts	102	3	**27,100**	21,200	5,000	16,200	5,900	15.30	78	60	76
Middle Atlantic	354	11	**21,800**	15,800	4,200	11,600	6,000	13.79	72	53	73
New York	152	5	**19,400**	13,300	4,300	9,000	6,100	14.34	69	46	68
Pennsylvania	165	5	**24,300**	18,700	4,100	14,600	5,600	12.77	77	60	78
East North Central	710	23	**22,100**	16,000	3,600	12,400	6,100	14.76	72	56	78
Ohio	254	8	**19,100**	13,700	3,200	10,500	5,400	14.16	72	55	77
Indiana	114	4	**23,600**	17,000	3,300	13,700	6,600	15.32	72	58	81
Illinois	201	7	**25,500**	19,000	4,700	14,300	6,500	15.66	75	56	75
Wisconsin	104	3	**22,000**	15,600	3,100	12,500	6,400	14.79	71	57	80
West North Central	203	7	**19,000**	13,900	2,700	11,200	5,100	13.49	73	59	81
Missouri	103	3	**19,300**	13,900	2,700	11,200	5,400	13.50	72	58	81
South Atlantic	450	15	**20,600**	14,600	2,800	11,800	6,000	13.28	71	57	81
Florida	149	5	**22,800**	15,200	2,600	12,600	7,600	13.74	67	55	83
East South Central	252	8	**18,300**	13,300	2,400	10,900	5,000	13.35	73	60	82
Tennessee	128	4	**19,300**	13,700	2,300	11,400	5,600	14.14	71	59	83
West South Central	470	15	**20,400**	13,100	2,400	10,700	7,300	13.26	64	52	82
Texas	298	10	**19,800**	12,500	2,400	10,100	7,300	13.30	63	51	81
Mountain	187	6	**21,200**	15,000	2,900	12,100	6,200	13.18	71	57	81
Pacific	280	9	**29,500**	19,900	4,300	15,600	9,600	12.06	67	53	78
California	245	8	**30,800**	20,800	4,400	16,400	10,000	12.28	68	53	79

Source: Basic data from Corporate Health Strategies; computations by Health and Safety Education Division

twice room and board to nearly five times greater. Looking at individual states, the data analysis reveals that the ancillary charges comprised 68 percent of the hospital bill in New York, yet these dollars constituted 83 percent of the total hospital bill in Florida and Tennessee.

Examining the charge data for the 12 states shown in the table revealed that the highest ancillary charges were recorded in California and Massachusetts—both over $16,000. On the other hand, these costs totaled just $9,000 in New York and were about $10,000 in Texas.

On the average, 71 percent of the total cost to health insurance for a coronary bypass was attributable to hospital charges.

Physician charges were found to vary extensively in this study. In the East South Central states the average charges were just $5,000 and were only slightly higher in the West North Central division. The cost for the nation as a whole averaged $6,400, and was $7,300 in Texas and $7,600 in Florida. In California, the strikingly high figure of $10,000 was nearly 60 percent higher than the countrywide total.

No Easy Explanations

The reasons for the wide variation in hospital and surgeon charges for coronary bypass surgery during 1982 and 1983 are not easily explained. The customary answers given by physician groups and other investigators relate to variability in medical practice behaviors by physicians, and to differing costs of living in regions of the United States.

Whatever the true underlying factors behind these widespread differences in charges, they would appear to have considerable impact on the costs of doing business in certain geographic regions of the country (e.g., the West Coast), and in specific states (e.g., California). For taxpayers, insurance companies with group health customers and American business in general, the 191,000 coronary bypass surgeries in the United States in 1983 represent a substantial concentration of the gross national product. Whether it is reasonable to allocate such resources for a single surgical procedure done late in the course of a disease—and with uncertain cost-effectiveness—is an important socioeconomic policy issue. □

Workdays Lost After Coronary Bypass Surgery

Of 147 Metropolitan Life Insurance Company employees who underwent coronary bypass surgery between 1974 and 1978, only nine were still actively at work on January 1, 1984.[1] These 147 employees accumulated nearly 70,000 work-loss days—measured from the date of operation to the end of the study; and they lost at least $4.4 million of salary—mostly recovered however through disability income payments. Not included in this study is the cost of hospital and medical care.

These results were from an updated study of coronary bypass surgery among Metropolitan Life Insurance Company's employees. The initial study covered persons who were gainfully employed before surgery in 1974-76; the ensuing experience was traced to May 1, 1978.[2] This analysis adds surgeries that took place in 1977 and 1978 and incorporates previously unavailable economic data.

Of the 147 employees whose history of coronary bypass surgery was followed, the vast majority were men (139) and nearly all were engaged in the selling and servicing of insurance products (125). Analysis by age showed that 83 employees, or 56 percent, were under 55 years of age at the time of the operation, with the remaining 64 cases aged 55-64. Half of all the bypass procedures took place in 1977 and 1978, with the annual incidence rate rising from 53 per 100,000 in 1974-76, to 84 per 100,000 in 1977-78; the overall rate was 66 per 100,000. The observed increase in the surgery incidence rate paralleled the national pattern in those years.

Among Metropolitan employees the annual incidence of the surgery for those aged 55-64 was four times as great as that for employees under 55 years of age; namely, 182 per 100,000 versus 44 per 100,000. In addition, the older group averaged more than twice as many days of illness preoperatively than did younger workers. The salary of workers aged 55-64, however, was only slightly higher than those under 55 years of age.

Recoveries Versus Nonrecoveries

If an employee *ever* returned to full-time work at Metropolitan following bypass surgery, he or she was considered to be in the "recovery" group. Within this category, 91 persons, or 62 percent of the coronary bypass recipients, returned to work full time. The percentage of employees under age 55 returning to work was considerably higher than that for those 55-64 years—72 percent compared with 48 percent. Those in the recovery group were somewhat younger and better paid than the workers who did not return to work. There was very little difference, however, in the mean number of service years between the two groups.

The percentage of employees returning to work was considerably higher when younger than age 55 than when 55-64 years old ..

There was a noticeable difference in the length of preoperative work loss between employees who were able to work again ("recoveries") and those who were not. The mean preoperative days of work lost for the persons who did not recover was 105 days or 15 weeks. By comparison, persons who recovered averaged just over five weeks lost from work before the bypass procedure. Analyses by age also show significant differences in the number of sick-leave days before surgery between the recovered and nonrecovered employees. Those patients who returned to work, averaged almost 20 weeks recuperating after surgery before starting to work again.

Another striking difference between the recovered and nonrecovered employees was the number of work days lost because of illness. The 91 persons who returned to work accumulated 9,000 days of absence while the 56 persons who remained out amassed 61,000

Table 1—Experience of Metropolitan Life Personnel Who Underwent Coronary Bypass Surgery in 1974-78

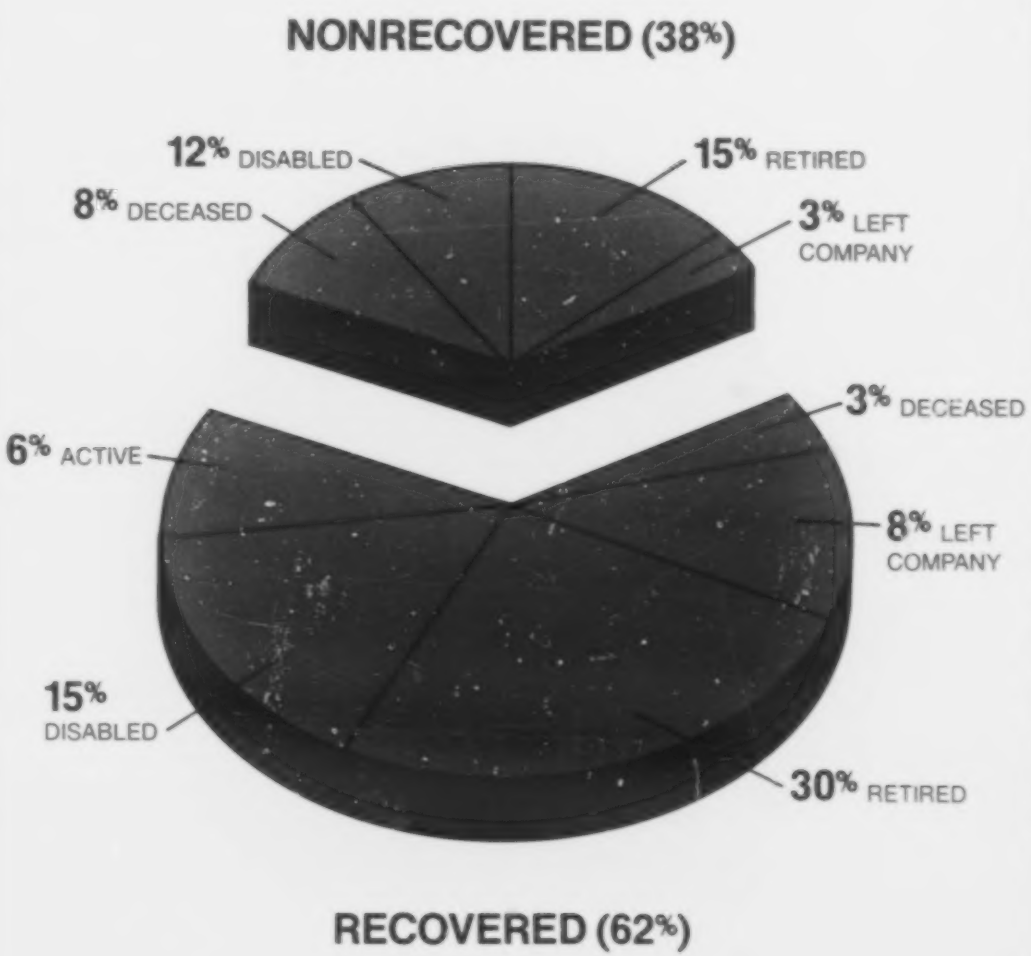
Cases Traced to December 31, 1983

	All Cases			Recoveries			Nonrecoveries		
Characteristics	All Ages	Under 55	55-64	All Ages	Under 55	55-64	All Ages	Under 55	55-64
Cases									
Number	147	83	64	91	60	31	56	23	33
Percent of total	100	100	100	62	72	48	38	28	52
Annual incidence of surgery per 100,000	66	44	182	41	32	88	25	12	94
Mean: Age	52	48	58	52	48	58	54	48	58
Service years	19	16	22	19	16	24	18	17	19
Weekly income ($)*	324	320	320	330	300	400	317	365	284
Mean disability days									
Before surgery	63	43	89	38	35	43	105	64	133
After surgery	—	—	—	136	138	136	—	—	—
Days lost from work									
Total (1,000's)	70	39	31	9	6	3	61	33	28
Mean per person	473	469	478	100	100	99	1,080	1,432	835
Income ($) loss (1,000's)									
Total	4,398	2,875	1,523	595	381	214	3,803	2,494	1,309
Mean per person	30	35	24	7	6	7	68	108	40

*Based on 101 cases

Note: Personnel in the Pacific Coast states and Canada are not included.

Status of Metropolitan Employees Who Underwent Bypass Surgery as of December 31, 1983



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days of illness. Thus, on the average, each returnee was absent for 100 days while a non-recovered person was out for 1,080 days (more than 10 times as long) before death or early retirement occurred.

Also of note is that among the returnees there was no difference in the mean number of illness days between employees under age 55 and those 55-64 years of age. On the other hand, among the employees who never returned to work, the younger group averaged 1,432 days of disability by the end of 1983—almost four years; those aged 55-64 accumulated 835 days or more than two and a quarter years.

Postoperative Illness

One way to assess the effectiveness of coronary bypass surgery is by the extent of recurrent bouts of *total illness* postoperatively. For example, of the 91 recovered persons, 53 had a total of 91 spells of recurrent illness. This represents an annual incidence rate of 330 per 1,000 during the follow-up period (mean 4.9 years). These employees averaged 65.7 illness (absentee) days per year and 199 medically related days out per occurrence.

Individuals who recovered from bypass surgery lost many more work days because of *cardiovascular illness* than the Metropolitan company average for the illness. Among the 91 recovered persons, a heart-related illness was subsequently reported in 45 persons, for a total of 62 occurrences. Among this group, the annual recurrence rate of heart-related illness was 225 per 1,000, the mean illness days, 57.1 per year and the mean days per occurrence, 254. By way of comparison, male sales personnel who were out sick with heart disease during 1977-79—but did not have bypass surgery reported an annual incidence of 10 per 1,000, 1.2 mean days per year and 116 illness days per occurrence.

One primary conclusion from this analysis is that the outlook seemed unfavorable for complete rehabilitation of workers who underwent coronary bypass surgery in the mid-1970s. As mentioned earlier, only nine employees of the 147 in the study group were in active service at the end of 1983. The figure on page 12 conveys the status of the 147 employees.

For individuals recovered from bypass surgery, workdays lost from cardiovascular illness were much greater than the Metropolitan average.

Nearly half (44) of the 91 recoverees retired during the study period, 22 remained out ill, an additional 12 were no longer employed by Metropolitan, and four had died by the end of 1983. Further analyses of the retired employees revealed that 17 were disabled with a heart-related condition at the time of their decision to retire—14 for more than one year. Additionally, of the 40 of the retirees who elected to leave the company before their normal retirement date, 18 were under age 60. Complete details of the experience of Metropolitan employees who underwent coronary bypass surgery are presented in Tables 1 and 2.

Toward Reducing Work-Loss Days

Relatively little has been published on the costs to business associated with work loss due to specific medical illnesses and procedures. In the case of 147 coronary bypass procedures, Metropolitan's costs in days of work lost seem dwarfed when one considers that 191,000 such surgeries were performed in 1983.

The 70,000 accumulated work-loss days by these 147 persons over six years constitute a major manpower loss, even for Metropolitan with 40,000 employees. Whether this experience is applicable to other companies cannot be stated with assurance; most likely, however, it is similar to many.

Metropolitan instituted a mandatory second-opinion program for surgery, including

Table 2—Work History Following Recovery from Coronary Bypass Surgery Among Metropolitan Life Personnel in 1974-78

Experience traced to December 31, 1983

Characteristics	All Ages	Under 55	55-64
Number recovering	91	60	31
Status at end of study			
Active	9	9	—
Disabled	22	21	1
Retired	44	17	27
Left Company	12	11	1
Deceased	4	2	2
Number with recurrent disability*			
All causes	53	37	16
Cardiovascular	45	30	15
Episodes of disability*			
All causes	91	69	22
Cardiovascular	62	44	18
Annual incidence of disability per 1,000*			
All causes	330	357	267
Cardiovascular	225	228	218
Mean annual days of disability per person†			
All causes	65.7	69.5	56.7
Cardiovascular	57.1	58.5	53.7
Mean duration of disability†			
All causes	199	195	213
Cardiovascular	254	257	246
Mean years follow-up‡	4.89	5.57	3.60

*Lasting longer than one week.
†Disability days less than one week or beyond one year are not included.
‡To earliest of retirement, departure or death.
Note: Personnel in the Pacific Coast states and Canada are not included.

coronary bypass surgery, commencing in 1984 for employees. It is too early, however, to determine whether it has effected any changes in surgical rates or work loss associated with the surgery.

Recently, a clinical consensus has been building that medical management may be as effective as surgery in many candidates for coronary bypass procedures, except those involving triple vessel or left main stem arterial disease. More aggressive medical management of many cases may change disability findings, especially those attributable to postoperative morbidity and preoperative preparations. Length of hospital stay with its attendant work loss, for example, may not translate directly into productivity gains when medical management occurs, because it also necessitates treatment that would require time away from work.

Regardless of the future course of surgical versus medical management of coronary heart disease, this cohort study of Metropolitan's surgical experience 1974-78 provides a base line for monitoring future experience with this procedure. □

Personnel in the Pacific Coast states and Canada are not included.
"Work history following coronary bypass surgery," *Statistical Bulletin* 60, 2-4, Oct-Dec 1979.

Commentary

Examining the True Costs of Coronary Bypass Surgery

Since 1967, coronary artery bypass surgery has swiftly become a multibillion-dollar-a-year industry in the United States. In 1983, 191,000 such surgeries were performed, representing an annual national outlay of over $4 billion. There is ample evidence that American business paid about $3 billion of this total amount.

Geographic Variations

Significant Regional Variations in Cost of Coronary Bypass Surgery shows striking geographic variations for physician and hospital charges per bypass case in the Metropolitan Life-insured population. This variation implies that efficiencies should be possible for these procedures in the future. Many American health care analysts believe, for example, that the number of physicians in an area directly affects the rate and the price of surgical procedures. Noteworthy, also, is that the federal government has moved to a system of payment based on diagnosis and procedure, with relatively minor adjustments for regional differences in the cost of living. The present reimbursement mechanism of most private insurers remains, however, based upon hospital and physician charges ("usual, customary and reasonable") for a particular locale. In light of statistical analysis like that shown in these articles, and the new federal system, private insurance reimbursement mechanisms should be reconsidered.

What is Achieved?

The second article in this issue, *Workdays Lost After Coronary Bypass Surgery* raises significant questions about the quality of life after this expensive procedure. Although the medical literature reports up to 95 percent five-year survival rates for this operation, the experience of a group of Metropolitan Life employees, 1974-78, followed for five years, provides a far less encouraging perspective. For example, five years after the bypass procedure, only 11 percent of those under age 55 at surgery were actively employed. Moreover, even those classified as having recovered from the surgery experienced extensive subsequent illness and absence from work.

Cost-effective Alternatives

These results are especially significant because recent medical research has conservatively estimated that surgery for coronary artery disease in at least 13 percent of cases is not therapeutically superior to medical management. In addition, a variety of alternative management techniques are becoming available, including percutaneous transluminal angioplasty, drug treatment, and behavioral changes such as stress management, smoking cessation, dietary changes, weight control and exercise.

The potential cost savings are considerable from substitution of less expensive alternative treatment forms. Such savings to American business could be as much as $300 million annually. Coronary artery bypass surgery represents the profound impact that technological progress can have on our health costs.

These high therapeutic costs serve to reemphasize the value of heart disease prevention (e.g., diet modification, smoking cessation and exercise), a subject needing greater emphasis in American business and industry, because of its strong potential contribution to work force efficiency. □

Philip Briggs
Mr Briggs is Executive Vice-President Group Department Metropolitan Life Insurance Company

Capsule Briefs

are timely literature selections with broad reader interest.

Mind-Body Connection

Do persons obtaining mental health care become physically healthier during that process? It may be so. The authors reviewed 58 controlled studies which investigaged this question and found that persons rece ving mental health services had lower hospitalization rates for medical reasons than control subjects. The effect seemed strongest for individuals over age 55, an observation with considerable practical potential because of high medical care costs related to that age group. (E. Mumford, *et al. American Journal of Psychiatry* 141:1145-1158, 1984.) □

Have a Stone-Age Appetite?

Experts agree that diet has substantially contributed to the increased 20th-century Western mortality rates from cardiovascular disease, diabetes and cancer. In this clinical-anthropological study, the authors compare the differences between an estimated Paleolithic diet, current American diet, and the U.S. Senate Select Committee-recommended diet. The current diet compared to Paleolithic seems deficient in protein, fiber, calcium and vitamin C. Sodium is the principal excess item. Because human genetics has changed very little since Paleolithic times, one may ask if it isn't time to get back to basics. (S. B. Eaton and M. Konner, *New England Journal of Medicine* 312:283-289, 1985.) □

Admission of Guilt?

Sometimes admission to the hospital is followed by a length of stay that is unnecessarily prolonged. In this study, the authors statistically investigated admission variables to determine how they affected preoperative and postoperative length of stay. Both were significantly longer ($P < 0.01$) when the patient was admitted through the emergency room, or the admission was on a Friday or a Saturday. The authors question whether inefficiency is an issue for hospitals with such admission characteristics. (L. J. Cannoodt and J. R. Knickman, *Health Services Research* 19:561-585, 1984.) □

Death: A Physician Stressor?

In a study of 132 Oregon physicians who had at least one patient death in the previous year, many (42 percent) reported that a patient's death was always or usually an emotionally stressful happening. Another 31 percent, however, reported that it was occasionally or never stressful. A subset (115) of these physicians reported a year later that they notified family members about death by telephone 43 percent of the time rather than in person, thus having less personal contact, in general, with families than the authors expected. A plea was made for more physician education in order to provide greater family support at time of death. (S. Tolle, *et al. Archives of Internal Medicine* 144:2389-2391, 1984.) □

Render Unto Obstetrics That...

Cesarean sections represented an increasing proportion of total deliveries in 18 areas across the United States during the interval 1977-82. In each year, the median rose steadily from 15.5 percent (1979) to 17.8 percent (1982). Author Gleicher, expressing concern about the increase, warned that "unless the medical community initiates a review process...others will press for outside review." In a related editorial, Rosen notes that the highest cesarean sections are often found in private practice areas of a hospital, but urges only further study for five more years. (N. Gleicher, *Journal of the American Medical Association* 252:3273-3276, 1984. M. G. Rosen, *JAMA* 252:3295, 1984.) □

Have a Heart

Surely the controversies should have long ago ended about whether better heart health results from diets lower in exogenous cholesterol or from diets that lower endogenous cholesterol synthesis. Not so. Several critics recently severely chastised a federal consensus of experts that recommended lowering serum cholesterol levels in childhood and adulthood. The critics conducted only a partial literature review, however, when they examined trial data. Neither the epidemiological nor experimental data were considered. (G. Kolata, *Science* 227:40-41; D. Steinberg, *Science* 227:582; C. Lefant, *Science* 227:582-3, *1985*.) □

Hidden Costs of Sexual Revolution

Two teenage sexually transmitted diseases, gonorrhea and pelvic inflammatory disease (PID), are the subject of this provocative report. Female teenage (15-19 years) gonorrhea rates (per 100,000) and PID more than doubled during 1970-80. Serious implications exist for future infertility, tubal pregnancies and chronic PID among affected women. Cervical cancer rates will also be higher in this cohort as they age. (L. Mascola, *et al, CDC Surveillance Summaries Morbidity and Mortality Weekly Report* 32(3SS):25SS-30SS, August 1983.) □

The Doctor's Not In (As Much)

Physician self-reported efficiency in America (1970-80) seems to be *increasing* one can infer from a recent American Medical Association study. From two studies of 4,252 physicians (1970) and 5,051 (1980), average weekly hours of work *decreased* by 3 percent (or 1.5 hours per week). When six subgroups were examined, age, sex, specialty group, type of practice, location, or whether U.S. or foreign medical graduate (FMG), it was found that only women physicians and FMGs *increased* their hours per week; all others worked slightly less. (M. P. Freiman and W. D. Marder, *American Journal of Public Health* 74(12):1348-1352, 1984.) □

Current Trends in International Mortality From Diseases of the Circulatory System

Cardiovascular disease remains the leading cause of death in the industrialized countries of the world, although these mortality rates are continuing the decline that began in the early 1970s. It is noteworthy that the recent decreases in the United States and Canada were far in excess of the experience reported for the group of Scandinavian and Western European countries.

This is the second article[1] in the current series of analyses comparing mortality rates in the United States with those in Canada and selected countries of Western Europe. The causes of death discussed in this report are diseases of the circulatory system (International Classification of Diseases, Ninth Revision, Codes 390-459; however, they reflect primarily Codes 410-414 (ischemic heart disease) and Codes 430-438 (cerebrovascular disease). Death rates for men and women aged 35-74 have been adjusted for the differences in each country's age distribution in order to make comparisons valid.

It is quite common to compare mortality rates in the United States with rates in particular countries, such as Sweden or the Netherlands. However, it is more appropriate that mortality in the United States be measured against the experience reported for the group of industrialized countries of Western Europe—the United Kingdom, France, Germany and Switzerland. These nations, taken together, more closely resemble the United States in population size, geographic diversity, degree of industrialization, variety of ethnic and cultural stock, and range of socioeconomic conditions.

Overall Decline in Circulatory Disease Mortality

As previously mentioned, mortality from circulatory disease among men aged 35-74 in the United States and Canada declined at a significant pace—continuing the trend started in the late 1960s. Between 1976 and 1981 the age-adjusted death rate from diseases of the circulatory system fell by 15 percent in the United States and by 18 percent in Canada.

In 1981 the circulatory disease death rate for men aged 35-74 was still highest in the United States.

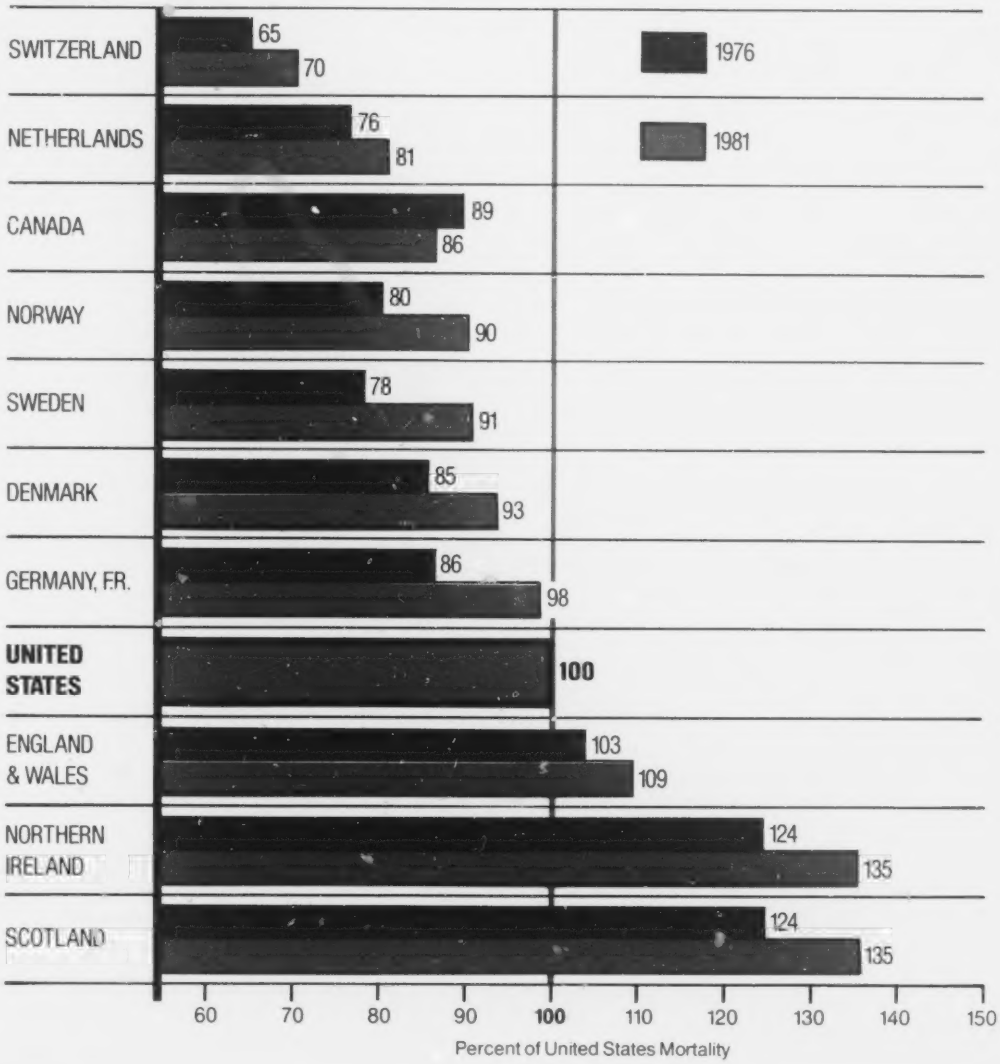
However, among their counterparts in the block of industrialized countries of Western Europe, the relative decrease was only about half as large—8 percent—and in the group of Scandinavian countries and the Netherlands, there was only a 6 percent decline. In 1981 the circulatory disease death rate for men aged 35-74 was still highest in the United States—namely, 552 per 100,000—followed by the rate of 499 in the highly developed countries of Western Europe, 482 in the Scandinavian countries and the Netherlands, and 474 per 100,000 in Canada.

As a result of the recent experience, the gap in mortality levels between the United States and the countries of Western Europe has narrowed appreciably. For example, in 1981 the death rate for men in the block of industrialized countries of Western Europe was 90 percent of that in the United States compared with 83 percent in 1976. For men residing in the Scandinavian countries and the Netherlands, the relative mortality in 1981 was 87 percent that of men in the United States, up from 79 percent in 1976.

Among the individual countries reviewed in this analysis, Scotland and Northern Ireland each experienced circulatory disease death rates of roughly 750 per 100,000 for men aged 35-74. On the other hand, in France, the rate was reported to be a low 327 per 100,000. It is important to note that in France reported causes of death are regarded as somewhat

Figure A

Relative Mortality From Diseases of the Circulatory System Among Men Aged 35-74 United States Compared With Selected Countries, 1976 and 1981
(In 1981 Rank Order)



questionable; for example, there is registered an unusually high mortality rate for senility, and for ill-defined and unknown causes. In 1981 the mortality rate in Switzerland was 387 per 100,000 and in the Netherlands the figure was about 450 per 100,000. Those 1981 death rates were much lower than in the United States—Switzerland (30 percent) and the Netherlands (19 percent). Together with Canada and Norway, these were the only other nations, however, to report a circulatory disease mortality rate of less than 500 per 100,000.

Progress in Individual Countries

Figure A shows the age-adjusted mortality ratios for 1976 and 1981 by individual country in comparison with the United States. (Data for France has not been shown because of reasons noted earlier.) As shown, Canada is the only country for which the mortality ratio improved in this period. On the other hand, Northern Ireland and Scotland experienced heart and vessel death rates that were 35 percent higher than in the United States; England's and Wales' rates were lower, but 9 percent greater than the United States. Interestingly, as a result of the circulatory disease death rate decline in the United States, the mortality level for men aged 35-74 in the Federal Republic of Germany is nearing parity with that of white men in the United States; the ratio was 98 percent in 1981. Between 1976 and 1981 the death rate from circulatory system diseases in the Federal Republic of Germany declined by just 3.7 percent and was the second lowest relative decrease among the countries reviewed. The dubious distinction of having the slowest decline falls to Sweden, where a reduction of less than 1 percent was registered which resulted in the comparative mortality ratio climbing to 91.

Experience Among Women

Similar to the experience for men, women aged 35-74 in the United States and Canada reported the largest relative decreases in mortality from heart disease—14 and 17 percent, respectively. In 1981 the age-adjusted death rate from this cause was 245 per 100,000 in the United States and 196 per 100,000 in Canada. At the same time in the block of highly industrialized countries of Western Europe, the mortality rate was 212 per 100,000 (representing a decline of 13 percent since 1976) and was 184 per 100,000 in the Scandinavian countries and the Netherlands (a reduction of 11 percent).

The 1981 death rate from cardiovascular disease among women in Switzerland—149 per 100,000—was the lowest among the countries studied (excluding France). Next in rank order was the Netherlands, closely followed by Norway and then Sweden, where the slowest mortality decline occurred.

Figure B presents the comparative mortality analysis for women. It can be seen that women aged 35-74 in Switzerland, Canada and Northern Ireland fared relatively better in reducing mortality from diseases of the circulatory system than did their counterparts in the United States. Notwithstanding, women in Northern Ireland experienced mortality rates in 1981 that were 37 percent higher than in the United States. Other countries that reported women's mortality in excess of the United States were Scotland at nearly 50 percent higher and England and Wales at just 6 percent more.

Increasing Mortality With Age

Mortality from diseases of the circulatory system generally increases rapidly after age 35-44. Among men in the United States in this study, death rates quadrupled between ages 35-44 and ages 45-54, nearly tripled between ages 45-54 and 55-64 and then doubled in the succeeding 10-year age group. In Canada, the Scandinavian countries and the Netherlands, and the block of Western European countries, the progressions in the death rates by age were somewhat larger. Women experienced a pattern similar to men. It should be noted, however, that overall the death rates among women were approximately two-fifths the rates among men.

It seems noteworthy that the past achieve-

Figure B

Relative Mortality From Diseases of the Circulatory System Among Women Aged 35-74 United States Compared With Selected Countries, 1976 and 1981
(In 1981 Rank Order)

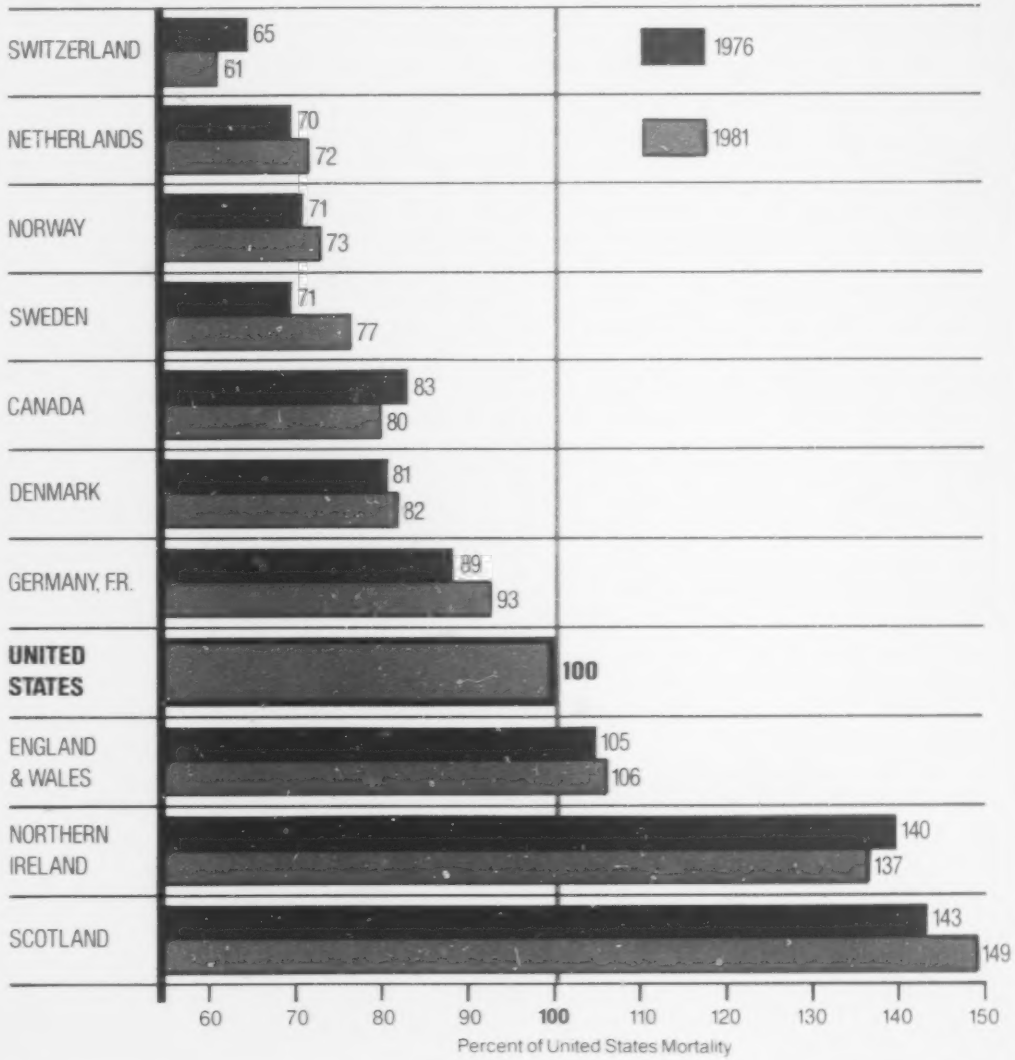


Table 1—Mortality from Diseases of the Circulatory System Among Men in Selected Countries—1976 and 1981

Death Rate per 100,000

Country	1976					1981				
	Ages 35-74*	Ages 35-44	Ages 45-54	Ages 55-64	Ages 65-74	Ages 35-74*	Ages 35-44	Ages 45-54	Ages 55-64	Ages 65-74
United States										
White	634.4	87.5	350.0	971.9	2,339.3	535.0	69.3	294.7	805.0	2,011.1
All Other	793.8	173.4	525.1	1,254.3	2,467.6	693.1	140.4	465.8	1,092.8	2,172.3
Total	650.8	97.6	368.7	998.3	2,351.9	552.2	78.3	314.3	833.6	2,026.6
Canada	578.6	74.8	315.1	883.2	2,163.0	473.6	59.7	249.2	704.7	1,826.3
Denmark	550.1	59.6	278.5	811.2	2,188.5	515.6	39.5	249.8	786.5	2,081.6
Norway	517.4	49.9	256.3	765.6	2,085.4	495.7	45.0	235.6	751.8	1,999.4
Sweden	506.2	44.6	215.2	737.6	2,157.6	502.7	43.3	214.0	723.1	2,160.5
Netherlands	496.3	52.8	247.2	721.0	2,004.6	449.8	43.4	217.4	660.9	1,819.5
Weighted Average	510.9	51.4	244.5	747.9	2,097.1	481.8	45.1	223.9	713.0	1,999.6
United Kingdom										
England and Wales	668.6	81.5	353.1	1,001.2	2,572.4	603.6	69.6	314.6	897.8	2,354.6
Northern Ireland	807.2	90.8	400.3	1,214.7	3,181.1	744.1	73.9	343.0	1,177.2	2,929.1
Scotland	808.4	95.5	437.2	1,247.7	3,033.1	747.8	94.1	429.0	1,114.5	2,794.7
France	375.8	53.1	181.8	509.9	1,553.0	327.4	47.3	164.8	427.8	1,362.0
Germany, Federal Republic	559.4	57.3	245.5	791.0	2,383.1	538.7	62.5	245.4	723.3	2,315.1
Switzerland	422.5	42.1	199.5	587.7	1,785.1	387.4	42.2	169.3	523.1	1,685.6
Weighted Average	541.8	62.8	261.1	795.8	2,202.4	498.7	60.4	242.2	704.1	2,050.4

*Adjusted on basis of age distribution of the United States total population, 1940

Note: France data for 1981 not available; 1980 figures used

Source of basic data: *World Health Statistics Annual* and various government annual reports

ments in reduction of heart and vessel disease mortality in a few countries have not been maintained in all age groups. Among men 35-74 years of age, the age-adjusted death rate between 1976 and 1981 declined only slightly in Sweden and in the Federal Republic of Germany. Moreover, in some countries there were a few scattered instances where the age specific death rates increased slightly or were virtually unchanged. Among women a decline in mortality of at least 5 percent was recorded in every age group—the only exception being those aged 65-74 in Scotland (2 percent). Tables 1 and 2 present age specific mortality rates from which this analysis was drawn.

Significant International Disparities

Studies of ischemic heart disease mortality have demonstrated significant international disparities. The National Heart, Lung, and Blood Institute's study of heart disease mortality in 27 countries for the period 1969-77 revealed similar results to those in this study.[2] In a recent paper, Dr. J. Stamler attributed the international mortality variations to different life-styles and risk factors.[3] Some of the other reasons given by epidemiologists to account for these disparities include different reporting procedures and practices in certifying deaths, and dissimilar medical standards.

Factors that experts have clearly associated with heart disease and stroke reduction

Table 2—Mortality from Diseases of the Circulatory System Among Women in Selected Countries—1976 and 1981

Death Rate per 100,000

Country	1976					1981				
	Ages 35-74*	Ages 35-44	Ages 45-54	Ages 55-64	Ages 65-74	Ages 35-74*	Ages 35-44	Ages 45-54	Ages 55-64	Ages 65-74
United States										
White	259.4	30.7	109.2	357.1	1,120.3	224.3	24.4	94.3	304.9	981.3
All Other	497.4	92.5	293.3	753.3	1,733.8	409.5	71.4	237.8	613.1	1,461.5
Total	284.2	39.0	130.4	396.0	1,178.1	245.3	31.0	113.0	338.4	1,029.0
Canada	235.0	25.7	92.5	302.5	1,071.7	195.6	20.9	74.6	254.5	895.0
Denmark	229.5	21.3	89.6	288.0	1,071.3	200.1	18.3	80.2	238.8	950.4
Norway	202.2	14.6	65.1	239.9	1,012.7	179.1	10.2	59.4	200.7	920.3
Sweden	202.6	21.1	61.4	229.5	1,023.1	187.9	16.8	54.3	210.8	967.0
Netherlands	199.4	20.5	70.3	219.7	994.3	175.5	17.9	66.3	198.1	857.2
Weighted Average	205.7	20.1	70.3	237.1	1,018.9	183.6	16.8	64.6	208.8	915.2
United Kingdom										
England and Wales	298.9	32.4	117.1	394.7	1,348.3	259.5	22.6	97.7	337.7	1,205.0
Northern Ireland	398.0	38.9	159.5	594.0	1,685.8	335.5	30.2	122.2	470.2	1,509.0
Scotland	405.0	46.5	178.4	585.9	1,687.6	365.5	32.2	134.7	505.3	1,653.7
France	160.8	20.4	58.8	187.8	768.0	131.6	17.9	47.5	141.1	647.1
Germany, Federal Republic	251.7	24.4	82.6	291.7	1,250.6	228.5	22.1	74.6	252.3	1,157.1
Switzerland	185.6	17.4	62.2	205.7	936.4	149.0	12.8	40.1	173.2	765.4
Weighted Average	243.0	25.8	87.5	305.8	1,151.9	212.4	21.1	73.3	254.9	1,039.0

*Adjusted on basis of age distribution of the United States total population, 1940

Note: France data for 1981 not available; 1980 figures used

Source of basic data: *World Health Statistics Annual* and various government annual reports

include the early identification and effective treatment of hypertension, smoking cessation, diets lower in cholesterol and saturated fats, and increased physical activity.[4] Whether medical and surgical technological advances (e.g., early diagnosis, cardiopulmonary resuscitation, coronary artery procedures) have played a role in the decreasing mortality remains an open, but important, question.[5] Moreover, there is a scientific consensus that death from heart disease and stroke are not an inevitable consequence of aging, if positive steps are taken by individuals and society to alter the most significant risk factors. Genetic factors may play a major role in 5 percent of the coronary heart disease deaths (and perhaps comparably in stroke, too), but generally familial patterns of heart and vessel disease are determined by life-style, not here ..ity. □

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Accident Death Toll: 1984

Accidents, the fourth leading cause of death in the United States, accounted for the loss of approximately 90,500 American lives in 1984, according to estimates made by Metropolitan Life Insurance Company. While these fatalities represent only a slight decrease over the 91,000 accidental deaths reported for 1983, it is significant and encouraging that the downward trend is continuing, albeit slowly. The 1984 total marked the third consecutive year since 1962 that accidental deaths were below 100,000.

1984 marked the third consecutive year that accidental deaths were below 100,000 since 1962.

The provisional mortality rate from accidents in 1984 was 38.3 per 100,000 population, a decrease of about 1.5 percent from the rate for the previous year and almost 6 percent below the rate for 1982. The rate of decrease in total accident mortality seems to be leveling off, due in part to the slight increase in motor vehicle accident fatalities in 1984 and in part to severe weather conditions resulting in accidental deaths during the year. The National Weather Service reported at least 400 cold-related deaths across the country in January 1984, and in February, several blizzards in the Midwest claimed at least 50 lives. Pedestrian and automobile occupant fatalities have not changed significantly since 1983. Deaths from accidents involving motorcycle drivers and occupants of trucks continue to increase, however, and account for most of the excess motor vehicle deaths in 1984.

Motor Vehicle Deaths Increase With Miles Driven

Motor vehicle accidents were responsible for close to 45,500 deaths in 1984. This total represents an increase of about 1,000 fatalities over those reported for 1983 and reverses the downward trend of the past four years. While fatalities were up, so were the number of vehicular miles traveled. The fatality rate for 1984 was 2.7 per 100 million miles traveled, a rate equal to the record low established in 1983. Seat belt legislation, changes in drinking age, changes in driving age and stronger penalties for driving while intoxicated all were designed to promote safer driving. Nonetheless, a number of factors including the stabilization of gasoline prices have led to an increase in the number of motor vehicles on the road with increased miles traveled and thus a greater chance of accidental death.

Nearly 40 percent of the catastrophic deaths in 1984 were associated with natural cataclysms and a quarter were the result of fires.

It is hoped that as more states enact seat belt legislation, as drinking ages are increased and standardized throughout the country, as increased effort is directed toward reducing motorcycle fatalities, and as more attention is paid to developing means of reducing truck fatalities, the previous downward trend in deaths from vehicular accidents will begin again.

Catastrophic Accidents* and Deaths by Type of Accident United States 1983 and 1984

Type of Accident	1983		1984	
	Accidents	Deaths	Accidents	Deaths
All types (total)	(65)	(537)	(69)	(620)
Motor vehicle (total)	(9)	(63)	(10)	(61)
Bus	3	24	2	14
Other	6	39	8	47
Air transportation (total)	(19)	(162)	(16)	(109)
Military	6	52	2	13
Civilian	13	110	14	96
Water transportation	(1)	(5)	(3)	(22)
Railroad	(0)	(0)	(2)	(9)
Fire and explosion (total)	(18)	(110)	(22)	(152)
Dwellings, apartments	10	56	16	106
Hotels, boarding houses	4	26	1	8
Convalescent homes, hospitals, etc.	1	6	1	5
Amusement area	0	0	1	8
Other	1	5	0	0
Explosion	2	17	3	25
Cataclysms (total)	(14)	(174)	(15)	(240)
Tornadoes	2	39	6	131
Hurricanes	1	17	0	0
Floods	7	67	4	30
Blizzards	1	8	3	66
Snow/Rainstorms	3	43	2	13
Mines and quarries	(1)	(7)	(1)	(27)
Other	(3)	(16)	(0)	(0)

*Accidents in which five or more were killed

Other Accidental Deaths Remain Stable or Decline

Deaths from injuries in and around the home accounted for an estimated 20,000 deaths in 1984, the same number of fatalities reported for the previous year. The provisional death rate from such accidents was about 8.5 per 100,000 population.

There were about 11,000 occupationally related deaths in 1984, which represent a decrease of 2.7 percent from the 1983 fatalities. It should be noted that approximately 3,500 of these occupational fatalities are also included in the estimated 45,500 motor vehicle deaths for the year. The 1984 work-related death rate was 11 per 100,000 workers and this represents no change over the rate for 1983.

About 620 people died in catastrophes during 1984.

A significant decrease in fatalities was associated with public accidents other than motor vehicular. Deaths included in this category of accidents decreased by 10 percent over the same group in 1983; that is, approximately 17,500 persons died in public accidents in 1984, down from 19,500 public fatalities reported in 1983.

Catastrophic Accidents in 1984

Based on data compiled and analyzed by Metropolitan Life Insurance Company personnel, approximately 620 people died in catastrophes (accidents taking five or more lives) during 1984. This death toll was approximately 13 percent higher than that recorded for the previous year. There was a significant decrease in deaths from total aviation accidents primarily because of a 75 percent reduction in the death toll attributed to military aircraft accidents. Significant increases in the number of deaths from every other type of catastrophe occurred, however, with the exception of motor vehicle accidents where the actual catastrophic death toll was approximately the same in 1984 as in 1983.

Accidental deaths involving motorcycle drivers and truck occupants continue to increase.

Close to 40 percent of the total catastrophic deaths in 1984 were associated with natural cataclysms (i.e., tornadoes, hurricanes, floods, blizzards) and a quarter were the result of fires, which claimed 152 lives. The majority (73 percent) of the catastrophic fires occurred in family dwellings (i.e., houses, apartments) and resulted in the loss of 30 adults' and 76 children's lives. Civilian aviation accidents contributed 15 percent to the total catastrophic deaths, and motor vehicles added a tenth to the overall mortality from catastrophes. As shown in the following table, the remaining proportions of deaths from catastrophic causes were divided between water transportation deaths (4 percent), military aviation deaths (2 percent) and railroad accident deaths (2 percent).

The death rate for 1984 was 2.7 per 100,000,000 miles traveled—equal to the record low rate in 1983.

Major Catastrophes

Two major catastrophes (defined as an accident resulting in the deaths of 25 or more

persons) occurred in the United States during 1984. One of these was weather related, the other was a fire in a coal mine; together they accounted for 89 deaths. A storm system at the end of March created a series of tornadoes in North and South Carolina claiming the lives of 57 residents there. More than 1,000 Carolinians were injured and at least 3,200 people were left homeless by the storm, which was labeled the worst disaster in the area in 100 years. The storm created heavy rains and flooding as it traveled north and was responsible for an additional five deaths. The total number of deaths from this weather-related catastrophe was 62.

The second major catastrophe happened on December 21 in Orangeville, Utah, when 27 miners (26 male and 1 female) were trapped and died in a smoky fire in a coal mine. This mine fire was the worst coal mining disaster in Utah in almost 60 years and the worst in the country since 1972. It is speculated that the fire was caused by an electrical system failure, but the mine remains sealed. An investigation into the cause of this accident, as well as its possible prevention, is currently being conducted.[2] □

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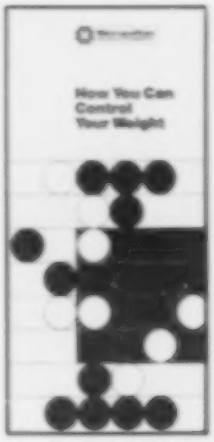
Health and Safety Education Materials Available From Metropolitan

1983 Metropolitan Height and Weight Chart. Weights by height based on lowest mortality for men and women of small, medium and large frames. (18 by 27 inches)

EAT WELL
BE WELL
1 Eat a Variety of Foods
2 Maintain Ideal Weight
3 Avoid Too Much Fat, Saturated Fat, and Cholesterol
4 Eat Foods with Adequate Starch and Fiber
5 Avoid Too Much Sugar
6 Avoid Too Much Sodium
7 If You Drink Alcohol, Do So in Moderation
Metropolitan

Eat Well, Be Well Poster. Bright garland of fruits and vegetables plus 7 dietary guidelines for wise eating and good health. (17 x 22 inches)



How You Can Control Your Weight. Leaflet offers effective ways to lose weight safely and maintain the loss. Specific nutrition information.

Eat Well, Be Well Recipe Booklet. 12 recipes based on the 7 dietary guidelines for meals low in fat, cholesterol, sugar and salt.

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Coming in Future Issues

- Mortality Trends of Lung and Breast Cancer in Women
- 1984 Life Expectancy of Men and Women
- Variations of Hysterectomy Costs by Region
- International Variations in Mortality from Cancer
- Current Population Estimates of U.S. and Canada by Geographic Subdivisions

Historical Perspectives

25 YEARS AGO

IN THE 1960 STATISTICAL BULLETIN

Metropolitan statisticians reported that there were 44,200,000 American families in 1959, representing 92 percent of the country's population. The number of families increased rapidly during the 1950s and was anticipated to exceed 60 million around 1980 (official total was 59,550,000—ed.). In husband-wife families, the average number of children under 18 was greatest where the husband was 35-44 years (2.29 children per family); for families headed by women, the number of dependent children was greatest at under age 35 (2.26 children). In view of the increasing number of families and escalating costs, Americans were making provision for their future through life insurance and other forms of thrift. At the end of 1959 there were approximately 115 million policyholders in the United States owning more than $530 billion of life insurance in private companies. (Page 6, April)

Motor vehicle accidents took a heavy toll of lives and recorded a death rate of 23 per 100,000 in 1957. Rates ranged from a low of 12.3 per 100,000 in the New England division of the country to 32.1 in the Mountain states. Metropolitan statisticians conducted a special study of white industrial policyholders to focus in on the major cause of the motor vehicle accident problem—those drivers in their teen ages and early 20s. It was determined that in 1958-59, the peak motor vehicle accident death rate among male policyholders occurred at ages 21 and 22. The rates increased sharply from seven deaths per 100,000 boys at ages 1-14 to 66 per 100,000 at ages 21-22. Thereafter the rates fell abruptly, but were as high as 40 per 100,000 at ages 23 and 24. Among females, death rates peaked at age 18 and again at ages 65-74, with rates of 17 and 18 per 100,000, respectively. For ages 1-74 combined, motor vehicle death rates among males were three times that among females. (Page 6, July)

Metropolitan statisticians reported on the evidence from the 1959 Build and Blood Pressure study that weight reduction had a favorable effect on longevity of overweight individuals. This confirmed the results of a previous Metropolitan Life study where overweight men and women who reduced experienced practically the same mortality as standard risks for a period of years following weight reduction. The 1959 study revealed that the mortality of those who reduced remained consistently below that of overweights who continued to pay extra premiums. Mortality for the group who reduced was compared to that of the group before weight reduction. In each of the weight classes, those who reduced had lower mortality than the group from which they were drawn. It was also pointed out that weight reduction is virtually routine in the treatment of heart disease and hypertension. It was emphasized that a proper diet (the avoidance of fad diets) and exercise could contribute to improved health and longevity. (Page 1, April)

Metropolitan statisticians drew attention to the frequency of suicides and reported that over 18,000 people in the United States took their lives each year. This resulted in a suicide death rate of about 10.7 per 100,000, making suicide eleventh among the causes of death in 1958. (Currently the rate is over 12.0 per 100,000 and eighth among the causes of death—ed.) Suicides were most frequent in spring (April) and least common in December. A 1958 breakdown by age, race and sex revealed that over a half of all white men who killed themselves used firearms; the proportion varied only slightly with age. Poisoning and hanging each accounted for about one-fifth of the suicides, but there was wide variation by age. Among women, poisoning and firearms were the leading methods used to take their own lives, accounting for one-third and one-fourth of the total suicides, respectively. Hanging increased in relative frequency with advance in age. (Page 9, December)

Outlook for further longevity was examined based on potential decrease in mortality from major causes of death. Cardiovascular-renal diseases, because of the magnitude of their death rates, had the greatest potential for increases in life expectancy. Even a 10 percent reduction in mortality from these conditions would add about two-thirds of a year of life to people in their 60s. A 20 percent reduction would add about 1⅓ years. Although cancer ranked second as a cause of death at the older ages, even a 20 percent reduction in mortality would add less than one-third year to the life expectancy. It was noted that marked reduction in cancer mortality would depend upon the development of more effective means for prevention and treatment of malignancies. (Page 1, November)

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